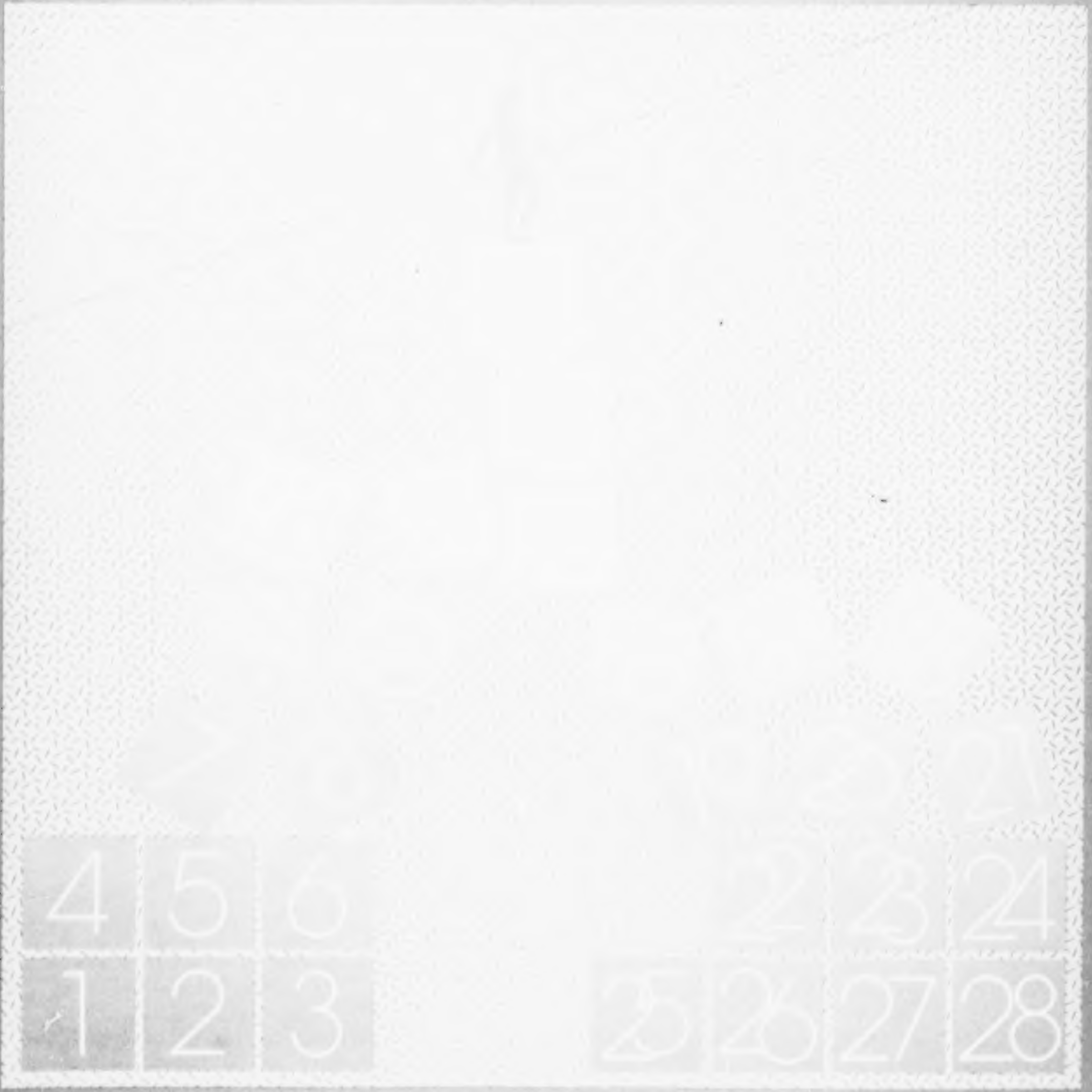
A5160-6

Volume 16, Number 1, March 1990

International Family Planning Perspectives

Failure Rates for the Ovulation Method

Who Forgets to Take the Pill?
Family Planning Among Poor Women in Rio



A Publication of
The Alan Guttmacher Institute

International Family Planning Perspectives

ISSN 0162–2749
Volume 16, Number 1, March 1990

Published quarterly by
The Alan Guttmacher Institute.

President: Jeannie I. Rosoff
Director of Publications and Editor-in-Chief:
Olivia Schieffelin Nordberg

Executive Editor: Jeanette H. Johnson
Editor: Michael Klitsch
Associate Editors: Frances A. Althaus,
Martha B. Witwer
Assistant Editor: Lisa Remez
Copy Editor: Patricia Rind
Production Manager: Diana V. Nolan
Production Assistants: Eric Loddé,
Georges Louis-Jacques, Lamia Matta
Administrative Assistant: Ruth A. Zlotnick

Contributing Editor, Law and
Public Policy: Susan Cohen

Consulting Editor:
Charles Westoff

Editorial Office:
111 Fifth Avenue
New York, N.Y. 10003
United States of America

© 1990 by The Alan Guttmacher Institute, An Independent, Nonprofit Corporation for Research, Policy Analysis and Public Education; all rights, including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention for the Protection of Literary and Artistic Works and the International and Pan American Copyright Convention. *Second-class postage paid at New York, N.Y. Postmaster: Send address changes to International Family Planning Perspectives, 111 Fifth Avenue, New York, N.Y. 10003.*

Table of Contents **Page**

Update 2

Articles

Contraceptive Failure of the Ovulation Method of Periodic Abstinence — James Trussell and Laurence Grummer-Strawn 5

Family Planning Among Low-Income Women in Rio de Janeiro: 1984–1985 — Sarah Hawker Costa, Ignez Ramos Martin, Sylvia Regina da Silva Freitas and Cristiane Schuch Pinto 16

Who Forgets to Take the Pill? The Thai Experience — Siriwan Siriboon, Chanpen Saengtienchai and John Knodel 23

Digest

Kenya: Tubal Ligation Seems to Be Gaining Acceptance Among Women and Men 29
Women in Botswana Use the Pill to Space Births, but Want Large Families 30
Developing Country Pill Users Experience Small Rise in Blood Pressure 32
Haitian Fertility May Have Risen in 1980s; Contraceptive Use Remains Low 33
Rates of Expulsion No Higher When IUD Is Inserted During Lactation 35
IUD Use Is Common, but Use of Hormonal, Barrier Methods Rare in Vietnam 36
Mexican Fertility Falls as Female Sterilization Becomes More Popular 36

Books in Review

A Unique Response To Population Growth — Susan H. Cochrane 39

Note to Authors 4

UPDATE

The Pill and the Risk of Cancer

Oral contraceptives appear no more likely to cause cancer among women in developing countries than they are to do so among women in developed countries, according to the results of an eight-country World Health Organization (WHO) study.[1] The WHO analysis showed, as other case-control studies had previously, that pill use has a protective effect against the development of endometrial and ovarian cancer, and that this effect is about the same in developed and developing countries. The overall risk of breast cancer with pill use was not significantly elevated; however, the relative risk in developing countries (1.2) was statistically significant, while the risk in developed countries (1.1) was not. In addition, the overall risk of cervical cancer in pill users was slightly elevated (1.2), but because of the number of confounding factors, the WHO could draw no definitive conclusions. There appeared to be no association between oral contraceptive use and liver or gallbladder cancer.

[1] D. B. Thomas, "OCs and Cancer Risk: Comparing Results from Developing and Developed Countries," *Outlook*, Vol. 7, No. 4, 1989, p. 2.

Economic Benefits of Breastfeeding

When an obstetrician at Manila's Dr. José Fabella Memorial Hospital, where about 100 births take place every day, decided to change normal postdelivery procedures, his aim was to encourage breastfeeding and reduce the incidence of infection.[1] Rather than crowd the infants together in the nursery, where cross-infection was common, the hospital staff began to bed the infants with their mothers and encourage the women to breastfeed the babies immediately. Not only has the approach proved successful, with the rate of infection among newborns far lower than before, but it has also produced unexpectedly substantial savings: The milk kitchen (where about 2,400 feeding bottles had been prepared daily) has been closed, about 90 nurses have been reassigned to other departments in the hospital and expenditures on bottles and on dried milk have been eliminated. As a result, the hospital is now saving about U.S. $300,000 annually—which represents about eight percent of its total operating budget.

[1] D. Morley, "Philippines: Bedding In," *Lancet*, I:101, 1990.

Tuberculosis and HIV

Tuberculosis, which has remained an important cause of death in the developing world, appears to be combining with human immunodeficiency virus (HIV) to further strain the health care system.[1] A review of recent research on HIV and tuberculosis concludes that in many developing countries, a high proportion of HIV-infected patients have tuberculosis, and that this combination of infections is seen most often in urban areas. Perhaps as a result, many of the African countries that have the highest levels of HIV infection also have reported a recent upsurge in cases of tuberculosis. The authors also note that tuberculosis cases in HIV-infected patients are more often centered in the heart, the peritoneum or throughout the body, making the disease much more difficult to diagnose.

[1] A. D. Harries, "Tuberculosis and Human Immunodeficiency Virus Infection in Developing Countries," *Lancet*, I:387, 1990.

Pill Use and Breastfeeding

Progestin-only oral contraceptives do not have a negative effect on breastfeeding, either for the mother or for her infant, the results of a recent study confirm.[1] Among a group of about 500 breastfeeding women, those who were using a pill containing levonorgestrel were no more likely to discontinue breastfeeding or to report a decrease in milk production than were those using nonhormonal contraceptive methods. In addition, there were no sizable differences between the two groups in the rate of infant growth or in weight gain. In fact, the only substantial difference between groups was that the women relying on nonhormonal methods were substantially more likely to have become pregnant than were those using the progestin-only pill. Given that combined pills have been shown to decrease milk production, the investigators conclude that "it is reasonable to promote progestin-only contraceptives as the formulation of choice for breastfeeding women who wish to use hormonal contraception."

[1] M. F. McCann et al., "The Effects of a Progestin-Only Oral Contraceptive (Levonorgestrel 0.03 mg) on Breastfeeding," *Contraception*, **40**:635, 1989.

Nova-T Effective for Up to Five Years

The Nova-T copper IUD remains highly effective for a full five years of use, according to the results of a recent prospective study of the device.[1] Among a group of 201 women who began using the IUD in 1981 and 1982, only six experienced an accidental pregnancy over the course of the next five years; all of the pregnancies occurred during the first two years of use. The Pearl index pregnancy rate at the end of five years was 1.2, and the net pregnancy rate was 3.2 per 100 users after five years. Most expulsions and removals (primarily because of infection) occurred among women under age 25, leading the investigators to comment that for women older than 25 who are in a stable relationship, the Nova-T represents "a most effective contraceptive method."

[1] P. Fugere, "Five Years Experience of Intrauterine Contraception with the Nova-T," *Contraception*, **41**:1, 1990.

Implant Insertion-Site Problems Rare

Only about one percent of some 2,674 users of NORPLANT®, the first widely used contraceptive implant, either developed an infection at the spot the device was inserted or expelled the hormone-filled capsules from the insertion site during the first year of use, according to a multicountry analysis of insertion-site complications.[1] Another five percent of implant acceptors experienced a local reaction, such as pain, itching or a rash. Two-thirds of the cases of infection occurred within 60 days of insertion; however, two-thirds of the expulsions took place two months or more after insertion. There were also wide variations in the rate of insertion-site complications both within and between countries.

[1] S. L. Klavon and G. S. Grubb, "Insertion Site Complications During the First Year of NORPLANT® Use," *Contraception*, 41:27, 1990.

Tarnish No Problem for IUDs

About one of every 10 Copper T-380 IUDs has reportedly been found to be tarnished while still in its packaging, but according to a recent report, clinicians around the world have no reason for concern.[1] The slight discoloration of the copper wiring—the result of a natural oxidation process—does not mean that the sterile packaging has been breached, and it will not impair the IUD's effectiveness. According to The Population Council, which developed the device, both tarnished and untarnished Copper Ts were used in their clinical trials, and there was no sign that tarnished IUDs were any less effective than untarnished devices.

[1] "Tarnished Copper IUDs Still Safe and Effective," *Network*, Vol. 10, No. 4, 1989, p. 12.

Maternal HIV Transmission: A Clue?

Infants born prematurely to a group of women infected with the human immunodeficiency virus (HIV) were far more likely to become HIV-infected themselves than were those born close to or at term (60 percent vs. 22 percent).[1] Fifty-three percent of full-term infants born to women with a low level of immune reaction to gp120 (a protein found in the envelope of the virus) developed HIV infection, compared with none of those born to women with medium resistance to the protein and seven percent of those born to women with high resistance. No such association was seen among infants born prematurely, however. They note that the antibody to the protein may afford infants some protection against HIV infection during the last trimester of pregnancy and that obstetric approaches intended to maximize the likelihood of full-term delivery may help to prevent mother-infant HIV transmission.

[1] J. J. Goedert et al., "Mother-to-Infant Transmission of Human Immunodeficiency Virus Type 1: Association with Prematurity or Low Anti-gp120," *Lancet*, II:1351, 1989.

What Birth Attendants Don't Know

Traditional birth attendants (TBAs) continue to be an important source of health care in Kenya. For example, even though many pregnant women living in a district near the capital, Mombasa, visit the nearby modern hospital for prenatal care, three-quarters of all pregnant women in the area deliver at home with the help of a TBA.[1] A study of 36 local TBAs revealed that together, the TBAs had performed 116 deliveries in the preceding month, almost three times the number performed at the hospital. Forty-two percent of the TBAs admitted that they knew nothing about the provision of routine prenatal care. Although all recognized that anemia or hemorrhage were high-risk conditions for pregnant women, fewer than half said they would refer a woman with such problems to the hospital. Three-quarters generally used a razor blade to cut the cord after delivery (generally a used, nonsterile razor blade). The authors report that because most of the TBAs had a "poor grasp of time," they tended to wait far too long to refer women having a difficult delivery to the hospital for emergency care; the result was that many such women died after admission to the hospital, further convincing the TBAs that it was better not to send patients to the hospital. The study findings will be used to formulate a training program for TBAs that will emphasize the importance of prenatal and postnatal care, the maintenance of sterility during and after delivery and the need for quick referral of complicated deliveries.

[1] M. M. Solomon and K. O. Rogo, "A Needs Assessment Study of Traditional Birth Attendants in Rural Kenya," *International Journal of Gynecology and Obstetrics*, 30:329, 1989.

Egypt's Success Against Diarrhea

In 1983, Egypt launched an extensive program to reduce diarrheal disease among infants and children. An evaluation has concluded that the program has been a success: Oral rehydration salts are now widely available, physicians usually prescribe oral rehydration therapy and parents generally use it correctly.[1] For example, in 1980, 27 percent of mothers surveyed had ever used oral rehydration salts and 12 percent knew how to mix them correctly; by 1987–1988, these proportions had risen to 66 percent and 88 percent, respectively. The impact of the program can be seen in mortality trends: The rate of infant mortality from diarrheal disease fell by four percent between 1970 and 1977 and by almost eight percent between 1978 and 1982, but dropped by 20 percent between 1983 and 1987; meanwhile, infant mortality from other causes fell only slightly. Similar trends can be seen for childhood mortality as well. The investigators observe that despite the program's apparent success, about 38,000 Egyptian infants and children died of diarrheal disease in 1987; they estimate, however, that if mortality rates had remained unchanged from the levels observed in 1982, the number of infant and child deaths from diarrheal disease in 1987 would have exceeded 100,000.

[1] M. El-Rafie et al., "Effect of Diarrheal Disease Control on Infant and Childhood Mortality in Egypt: Report from the National Control of Diarrheal Diseases Project," *Lancet*, I:334, 1990.

Pregnancy and Death in Bangladesh

Homicide or suicide during pregnancy and complications of illegal induced abortion are among the major causes of death among women of reproductive age in Bangladesh, according to an 11-year study of mortality in Matlab *thana*.[1] Overall, almost one in five deaths among reproductive-age women (including one in three deaths among 15–19-year-olds) were related to accident or violence, and more than half of them occurred during pregnancy. Sixty percent of these maternal deaths were caused by complications from induced abortion, and most of the remainder were either suicides (17 percent) or homicides (eight percent). Furthermore, almost three-quarters of all maternal deaths among unmarried women were related to suicide or induced abortion. Unmarried 15–19-year-olds were 10 times as likely as married 15–19-year-olds to have died from an abortion. In addition, only 29 percent of married women and 12 percent of unmarried women who died as a result of abortion were taken to a hospital before they died.

[1] V. Fauveau and T. Blanchet, "Deaths from Injuries and Induced Abortion Among Rural Bangladeshi Women," *Social Science in Medicine*, 29:1121, 1989.

Note to Authors

International Family Planning Perspectives is a peer-reviewed quarterly journal publishing research articles about the developing world that are intended to be of assistance to professionals in the fields of fertility and family planning, maternal and child health and population policy. The editors invite researchers, policymakers and program operators from around the world to submit articles on such topics as contraceptive practice and research; population growth; fertility levels, trends and determinants; childspacing; public policies and legal issues affecting family planning and childbearing; family planning program operation, development and evaluation; information, education and communication activities; sexually transmitted diseases; and reproductive, maternal and child health. Manuscripts should be sent to the address below, and should include the complete affiliation, address, telephone number and Fax number (if possible) of the author with whom we are to correspond.

Manuscripts may be submitted in English, French or Spanish, and are read with the understanding that they neither are under consideration elsewhere nor have been published previously. All submissions are reviewed by the editorial staff and, if deemed of interest, undergo anonymous peer review. Manuscripts not accepted for publication will not be returned. Upon acceptance, all manuscripts will be edited to the extent necessary to conform to the style of the journal. Authors will have two opportunities to review their article after it has been edited. Authors must assign copyright to the journal.

Selected articles appear on an annual basis in the Spanish edition of the journal, *Perspectivas Internacionales en Planificación Familiar*, and in the French edition, *Perspectives Internationales sur le Planning Familial*.

Manuscripts should be typed double-spaced, with all pages numbered and with a title page that includes the names and affiliations (at the time of the work reported) of all authors. Submissions should run no more than 30–35 pages, with no more than 7–8 tables; only one copy need be sent. Manuscripts should include a summary of up to one page in length.

Each table and chart should be on a separate page. Authors should check previous issues of *International Family Planning Perspectives* to gain an idea of how tables are to be styled. Authors must supply data points for all line graphs and charts; final art work will be done by the journal's staff.

Nota para Autores

International Family Planning Perspectives es una revista trimestral que publica monografías sobre el mundo en desarrollo destinadas a asistir a profesionales en las esferas de fecundidad y planificación familiar, salud maternoinfantil y política de población. Invitamos a investigadores y responsables de políticas y programas de todo el mundo a que presenten artículos sobre temas tales como práctica e investigación en materia de anticonceptivos; crecimiento demográfico; niveles, tendencias y determinantes de la fecundidad; espaciamento de los hijos; políticas oficiales y cuestiones jurídicas que afecten la planificación familiar y la fecundidad; aplicación, elaboración y evaluación de programas de planificación familiar; actividades de información, instrucción y comunicación; enfermedades transmitidas sexualmente y salud reproductiva y maternoinfantil. Los originales deben enviarse a la dirección que figura más abajo, debiendo constar en ellos filiación completa, domicilio postal, teléfono y, de ser posible, numero de Fax del remitente.

Los originales pueden ser en español, francés o inglés. Serán aceptados en la inteligencia de que son inéditos y no están siendo considerados por ninguna otra publicación. El personal de edición examinará todos los trabajos presentados y, de hallarlos interesantes, los hará evaluar por otros especialistas sin divulgar el nombre del autor. No se devolverán los originales rechazados. Los que se acepten serán revisados en la medida necesaria para conformarlos al estilo de la revista. Los autores tendrán dos oportunidades de examinar sus monografías revisadas y deberán ceder los derechos a la revista.

Algunos artículos se seleccionarán para las ediciones anuales española, *Perspectivas Internacionales de Planificación Familiar*, y francesa, *Perspectives Internationales sur le Planning Familial*.

Los originales deberán presentarse dactilografiados a doble espacio. Las páginas deberán ir numeradas, debiendo figurar en la primera nombre y filiación (al momento de escribirse el trabajo) completos de todos los autores. Los artículos no podrán exceder las 35 páginas ni incluir más de ocho cuadros. No hace falta enviar sino un ejemplar. Los originales deberán ir acompañados de un resumen de hasta una página.

Cada tabla o gráfico deberá ir en hoja aparte. Conviene que los autores consulten números anteriores de *International Family Planning Perspectives* para hacerse una idea del respectivo formato. Deberán suministrar también todas las cifras y datos necesarios para cada gráfico o cuadro. La revista se encargara del diseño gráfico.

Note aux auteurs

La revue trimestrielle *International Family Planning Perspectives* publie des articles présentant des résultats de recherche sur les pays en développement et destinés à éclairer les spécialistes de la fécondité, de la planification familiale ainsi que de la santé maternelle et infantile et des politiques démographiques. La rédaction invite tout chercheur, dirigeant ou administrateur de programme du monde entier à soumettre des articles sur les sujets suivants: pratique contraceptive et recherche dans le domaine de la contraception; croissance démographique; niveaux, tendances et facteurs déterminants de la fécondité; espacement des naissances; questions juridiques et d'ordre public influant sur la planification familiale et la procréation; administration, élaboration et évaluation de programmes de planification familiale; activités relatives à l'information, l'éducation et la communication; maladies sexuellement transmissibles; hygiène sexuelle et comportement reproducteur; et santé maternelle et infantile.

Les auteurs doivent adresser les manuscrits à l'adresse ci-dessous et mentionner les références complètes, adresse, numéro de téléphone et numéro de télécopieur (si possible) de la personne avec qui nous devons communiquer. Les manuscrits peuvent être rédigé en anglais, en français ou en espagnol et ne seront acceptés qu'à la condition qu'ils n'aient été soumis à aucune autre publication, ni déjà publiés. Tous les articles sont édités par la rédaction et s'ils sont jugés intéressants, présenté, à titre anonyme, à l'appréciation de spécialistes. Les manuscrits non publiés ne seront pas renvoyés à leur(s) auteur(s). Une fois acceptés, les manuscrits seront éventuellement édités afin de les adapter au style et présentation propres à la revue. Les auteurs auront ensuite, à deux reprises, l'occasion de revoir leur article. Ils devront céder les droits d'auteur à la revue.

Certains articles retenus sont également publiés dans les éditions annuelles de la revue, en espagnol, *Perspectivas Internacionales en Planificación Familiar* et en français, *Perspectives Internationales sur le Planning Familial*.

Tous les manuscrits doivent être préparés de la manière suivante: Ils doivent être dactylographiés en double interligne, avec un maximum de 30–35 pages et chaque feuillet doit être soigneusement paginé.

La première page doit fournir les noms de tous les auteurs ainsi que leurs références (au moment où travaux ou recherches ont été effectués). Ils ne doivent pas comporter plus de 7–8 tableaux et doivent inclure un résumé ne dépassant pas une page. L'auteur ne doit soumettre qu'un seul exemplaire.

Tableaux et graphiques devront figurer chacun sur un feuillet séparé. Les auteurs sont priés de consulter les numéros précédents de la revue afin de voir comment les tableaux doivent être présentés. Ils devront également fournir les points de données pour tous diagrammes et graphiques.

Olivia Schieffelin Nordberg
Editor-in-Chief
International Family Planning Perspectives
The Alan Guttmacher Institute
111 Fifth Avenue
New York, NY 10003
USA

Contraceptive Failure of the Ovulation Method of Periodic Abstinence

Of all contraceptive methods, variants of periodic abstinence are probably the least forgiving of imperfect use; the pill is probably the most forgiving of imperfect use and barrier methods and withdrawal should fall between these extremes.

By James Trussell and Laurence Grummer-Strawn

Summary

Previously published estimates of probabilities of method and user failure for all contraceptive methods suffer from a serious methodological error and are biased downward, with the extent of bias unknown. Data from a World Health Organization clinical trial of the ovulation method of periodic abstinence were used to provide the first correctly calculated measures of method and user efficacy and to determine the characteristics that distinguish women who consciously take risks from those who do not. Probabilities of pregnancy during the first year are 3.1 percent during perfect use (method failure) and 86.4 percent during imperfect use (user failure). Thus, if used perfectly, the ovulation method is very effective. However, it is extremely unforgiving of imperfect use. Because perfect compliance is difficult for many couples who desire intercourse when it is forbidden by ovulation method rules, and because the risk of pregnancy during imperfect use is so great, the ovulation method cannot be considered an ideal contraceptive method for the typical couple, who are likely to be less compliant than couples who volunteer for a clinical trial. The probability of an accidental pregnancy is greatest when any of the three most serious rules—no intercourse during mucus days, within three days after the day of peak fecundity or during times of stress—are broken. Those who have a poor attitude toward the rules are more likely to take risks, including serious risks. Those who get away with taking a risk (i.e., do not get pregnant) are very likely to take risks again. Because breaking the most serious rules entails a 28 percent risk of pregnancy per cycle, those likely to take risks should be counseled about the probable consequences.

Introduction

To make truly informed choices about contraception, couples need to know not only the efficacy of methods as they are actually used and misused by real couples (the only firm measure of contraceptive failure now available), but also the efficacy of methods when used correctly and consistently and when used imperfectly. The difference between failure rates during imperfect and perfect use provides couples with a measure of how forgiving of imperfect use a particular method is likely to be. The proportion of months (or menstrual cycles) characterized by perfect use (or the proportion of users who always use a method perfectly) provides couples with a measure of how difficult a method is to use correctly and consistently.

A previous comprehensive review of the literature on contraceptive failure identified several areas in which research is critically needed.[1] Foremost among these is proper measurement of the risk of method and user failure for all contraceptives. This article takes a first step toward that goal by providing estimates of method and user efficacy for the ovulation method of periodic abstinence. In addition, it provides the first information on variables associated with risk-taking behavior among users of this method.

The ovulation method is based on the discovery that changes in the characteristics of cervical mucus closely mirror hormonal changes during the menstrual cycle. Before 1975, very little information was available on a woman's ability to detect and interpret changes in her cervical mucus. Thus, the World Health Organization (WHO) conducted a clinical trial in centers in five countries (New Zealand, India, Ireland, the Philippines and El Salvador) to determine the proportion of women able to detect these changes, the factors affecting this ability and the efficacy of this approach to fertility limitation.

The results of that investigation, published in a series of five articles, have significantly enhanced our understanding of these questions.[2] The first striking finding was that 94 percent of the surveyed women (who were drawn from a wide variety of social, economic and cultural backgrounds) were able to detect the change in cervical mucus that signals the onset of the fecund period. After the first teaching cycle, 91 percent of the participants were rated as having a good or excellent understanding of the method.[3] After successful completion of a three-cycle teaching phase, 725 women entered a 13-cycle efficacy phase and collectively contributed 7,514 cycles of observation. The 13-cycle life-table pregnancy rate was 19.6 percent.

Unfortunately, the investigators published method efficacy rates computed by the standard procedure, which, we contend, is flawed. These calculations showed Pearl indices* of 2.8 and 18.9 for method failure and user failure, respectively, with one additional pregnancy (an index of 0.5) that was not unambiguously attributable to either method or user error.[4] As part of their analysis, the investigators examined

---

James Trussell is professor of economics and public affairs and Laurence Grummer-Strawn is a research student, both with the Office of Population Research, Princeton University. Germán Rodriguez, Jennifer Strickler and Barbera Vaughan gave advice throughout this project; P. F. A. Van Look, T. M. M. Farley and A. Pinol at the World Health Organization provided the data and generous advice; and Jane Menken, J. M. Spieler, Felicia Stewart and Judith Tilton offered helpful comments on an earlier draft.

*The Pearl index is obtained by dividing unintentional pregnancies by the number of woman-years of exposure to the risk of unintended pregnancy. It is usually then multiplied by 100. The defects of this index as a measure of contraceptive failure are discussed at length elsewhere (see: reference 1). The basic problem is that failure rates decline with duration of use, either because those prone to fail do so early, leaving a group increasingly unlikely to become accidentally pregnant, or because women (or couples) become better users with more experience. Consequently, Pearl indices from different studies are not comparable when average durations of exposure vary across studies.

psychosexual aspects of the ovulation method, including satisfaction of women and their partners and the prevalence of rule breaking.[5] The only characteristic of women examined in these analyses was their country of residence. Thus, this rich data set can be analyzed further to yield information that is both entirely new and clinically useful to counselors and couples considering the ovulation method. Specifically, characteristics that distinguish those who consciously break the rules from those who do not can be identified.

The major problem in drawing inferences from the experience of users of a contraceptive method occurs because women (or couples) select their own method, with their choice governed by a variety of factors such as cost, convenience and safety.[6] When data are drawn from a nationally representative sample of women, as is the case for the National Survey of Family Growth, results concerning contraceptive failure pertain to the population of women who choose to use each method. Self-selection of the method creates uncertainty, however, about what the experience of women would be if they were randomly assigned to a method. Our suspicion is that women who choose to use spermicides, for example, are inherently less successful users of any contraceptive than are women who choose to use the pill. Therefore, observed spermicide failure rates probably underestimate efficacy that would be achieved if users were chosen at random.

Efficacy data from clinical trials are yet another step removed from the population for which one would wish to make inferences, because the sample of users of a method in a trial is not even representative of the larger population of women who choose to use that method. Nevertheless, most efficacy information is drawn from clinical trials, simply because the data are rich and relatively plentiful.

We will not directly address the intractable issue of sample selection in this article. Our own results necessarily will pertain only to those women who satisfied the criteria for selection into the WHO trial—regularly ovulating women of proven fecundity who had not previously used the ovulation method and who were willing volunteers. However, we reason that the effect of selection on efficacy operates predominantly through consistency and correctness of use and consequently that selection does not significantly affect measures of inherent method efficacy (when computed correctly). Therefore, our estimate of the probability of method failure during perfect use should generalize to the population of potential users. Our estimate of the overall probability of failure during imperfect use depends on the particular combination of ways in which women in the trial broke the ovulation method rules, but our estimates for specific types of rule breaking should generalize beyond the sample.

Measuring User and Method Failure

Many investigators have recognized the importance of distinguishing between contraceptive failure attributable to user error and failure attributable to the inadequacy of the method itself. By convention, all pregnancies that occur during a month (or menstrual cycle) in which a method either is not used at every act of intercourse or is used improperly are labeled user failures. Only pregnancies that occur during a month (or cycle) during which a method is used perfectly are classified as method failures; perfect use does not imply that the method did not fail, only that the method was used consistently and correctly according to a well-specified set of rules. We have no objection to this convention (indeed, it is necessary), but it must be understood that not all pregnancies classified as user failures will in fact be user failures. For example, if in one month (or cycle) a method is not used or is used incorrectly during two acts of intercourse but is used correctly during eight other acts, a resulting pregnancy cannot unambiguously be attributed to user error instead of method failure.

The standard procedure is to compute separate method and user failure rates (pregnancies divided by exposure). In this procedure, all exposure from perfect and imperfect use is included in the denominator of both method and user failure rates. According to this convention, method and user failures are treated as two of many possible causes of method discontinuation. The sum of all cause-specific discontinuation rates is the overall or total discontinuation rate, and the sum of method and user failure rates is the overall or total failure rate. The common misinterpretation is that the resulting method rate yields information about the inherent efficacy of the method. Inherent method efficacy can be measured only when the numerator (method failures) is assessed in relation to the proper risk set (exposure only when the method is used perfectly). Method failure rates computed by the standard procedure confound inherent method efficacy with the proportion of exposure that is characterized by perfect use.

The following example illustrates how misleading the conventional interpretation can be. Suppose that we decide to evaluate an innovative contraceptive regime that is claimed not only to prevent pregnancy but also to enhance health. It requires a woman to stand on her head and drink orange juice during each act of intercourse. We conduct a clinical trial, which yields the amazing result that the method failure rate is zero percent, although common sense would dictate that the method is absolutely worthless (except insofar as perfect use would drastically reduce coital frequency). However, unbeknownst to us because we followed standard procedure and did not inquire, the sole reason for this zero percent failure rate is that no woman ever achieved perfect use in any cycle. By convention, no pregnancies can be classified as method failures if all exposure is characterized by imperfect use. Such reasoning leads to the conclusion that it makes no sense to treat method and user failures as causes of discontinuation. To be treated as a cause, an event must be a possible outcome for those in the risk set.[*] In an IUD trial, expulsion, removal for pain or bleeding and accidental pregnancy are proper competing risks; in contrast, user vs. method failures make no more sense as competing risks than do black vs. white pregnancies or teenage vs. adult pregnancies, because each of these alternative events is conditional on a separate risk set.

Conventionally computed method failure rates have definitely generated controversy. For example, the lowest Pearl index for periodic abstinence in the literature was obtained in a study of 282 women in Tonga.[7] The investigators discarded 50 pregnancies judged to have resulted from improper use and then calculated an index of 1.4 failures per 100 woman-years of exposure to risk. This study sparked a lively debate. John Marshall[8] and Roger Rochat[9] argued that it would be misleading to exclude the 50 pregnancies attributed to user error, so they added them to the numerator, thereby obtaining a Pearl index of 25.4. Henry Mosley stressed that the index of 1.4 was a theoretical measure of failure, while the index of 25.4 was a

---

[*] *For example, death rates by cause add to the overall death rate, because all persons are assumed to be at risk of dying from any cause. Clearly, one might argue that all persons are not exposed to every cause of death, even when analysis is age-specific and gender-specific. For example, a woman is not at risk of maternal mortality if she is sterile (or not having intercourse). However, such examples illustrate problems with the cause-of-death methodology rather than provide support for the standard procedure of computing method failure rates.*

Table 1. Summary of the ovulation method of fertility regulation

Approximate cycle day	Phase	How identified	Intercourse allowed?
1–5	Menstruation	Bleeding	No
6–9	Dry days	Absence of cervical mucus	On alternate nights only
10	Fecund period begins	Onset of sticky mucus secretion	No
16	Peak fecund day	Last day on which slippery mucus (resembling raw egg white) is observed	No
19	Fecund period ends	Evening of the third day after the peak day	No
20–29	Safe period	From evening of fourth day after peak day until onset of bleeding	Yes

Note: The cycle begins on the first day of menstruation. Menses is considered unsafe for intercourse because it is impossible to identify cervical mucus in the presence of bleeding and women with short cycles may enter the fecund period during the last days of bleeding. In the early (prefecund) dry days, cervical mucus is absent, but intercourse is allowed only on alternate nights (to minimize confusion between semen and cervical mucus). The fecund period begins on the first day on which cervical mucus is observed. When cervical mucus first appears, it is "sticky" and actually signals an infecund period for the woman. But, because sperm can survive for several days, intercourse is forbidden from the onset of sticky mucus. When the cervical mucus changes consistency by becoming "slippery" and resembling raw egg white, the woman has entered the most fertile phase of her cycle. The day of peak fecundity is identified retrospectively as the last day on which slippery mucus is observed; it usually, but not always, coincides with the day of maximum slippery mucus. The peak day marks the last day of the follicular (preovulatory) phase of the cycle; the luteal (postovulatory) phase begins on the following day. Intercourse is not allowed from the first day of sticky mucus until the evening of the fourth day past the peak day. The remainder of the cycle is considered safe. However, because stress can affect the quality of mucus, intercourse is forbidden during periods of stress. In the typical cycle of 29 days, intercourse would be allowed on about 12 nights (see: WHO, 1983, op. cit. [reference 2]). Checking cervical mucus involves several steps: First, the woman ascertains whether she feels a sensation of wetness or dryness. After obtaining mucus directly from the vaginal opening using a finger or toilet paper, she focuses primarily on its quality (lubrication, elasticity, wetness and tackiness) and secondarily on its color and quantity (see: D. Guren and N. Gillette, *The Ovulation Method: Cycles of Fertility*, Ovulation Method Teachers Association, 1984, Portland, Oreg.).

measure of failure during actual use.[10] No one pointed out the real error in the calculation yielding the index of 1.4.

This error is quite widespread; method (or theoretical) failure rates have almost always been calculated incorrectly, because investigators remove only the pregnancies attributable to improper use from the analysis, although they retain all exposure. For example, in our review of 13 clinical trials of periodic abstinence, "method only" calculations (all incorrect) were found in 10, including the WHO analysis of ovulation method efficacy.[11]

The analytical error is the failure to realize that, by convention, method failures can occur only when the method is being used perfectly. Logically, as discussed above, method failures can occur during both imperfect and perfect use. During perfect use, however, the only failures that can occur are method failures, and method failure rates can be measured only when the method is used perfectly. The difference between the failure rate during imperfect use and the failure rate during perfect use provides a measure of the contribution of imperfect use to the likelihood of failure. Because the experimental design of most studies (the WHO study being an important exception) probes for imperfect use only when there is a pregnancy, method failure rates cannot be computed even if the investigators recognize the error in the standard procedure. As a consequence of this computational error, failure rates that are reported as method failure rates in the literature are too low, with the extent of the downward bias unknowable. For the same reason, user failure rates reported in the literature are also too low. Whether conventionally computed method failure rates are more or less severely biased than user failure rates depends on the proportion of total exposure characterized by perfect use.

Only three studies have calculated method failure rates correctly.[12] Nevertheless, none of these investigators identified their rates as "method" failure rates, and none of their publications informed subsequent work on method vs. user failure; furthermore, all estimates of failure were based on Pearl indices rather than on life tables, which control for duration of use. In principle, one could calculate method failure in two ways. First, one could split the sample into those who never used the method imperfectly and those who did so at least once. The resulting rates would pertain to perfect and imperfect users. This approach was taken by Eleanor Mears and N. W. Please and by A. P. K. John in analyses of the failure of spermicides and condoms, respectively.[13] Alternatively, the exposure (and failures) during periods of perfect use by the imperfect users could be combined with the exposure (and failures) of the perfect users to create measures of failure during perfect and imperfect use. Hilliard Dubrow and Katherine Kuder constructed rates in this manner in an analysis of failure of spermicides and the diaphragm.[14] Method failure rates yielded by the two approaches should be similar, provided that cycles of perfect use contributed by imperfect users are characterized by levels of coital frequency and underlying fecundity similar to those of perfect users. User failure rates will be higher if the second approach is used, because the exposure pertains solely to imperfect use.

Because previous investigators have not probed for rule breaking at times when an accidental pregnancy did not take place, our understanding of the covariates of user and method failure is quite limited. Existing analyses are of dubious value, because their examinations of the covariates of "method" failure have measured method failure according to the standard procedure. For example, a reanalysis of worldwide data on the contraceptive sponge claims that there is no difference in method failure rates between parous and nulliparous women.[15] In contrast, analysis of the U.S. data reveals overall first-year failure probabilities of 28.3 percent among parous women and 13.9 percent among nulliparous women; no difference by parity was found for diaphragm users.[16]

Data

WHO invited five centers with experience in teaching the ovulation method to participate in a clinical trial. The centers were located in Auckland (New Zealand), Bangalore (India), Dublin (Ireland), Manila (the Philippines) and San Miguel (El Salvador). To participate in the trial, women had to be younger than 39, to have menstrual cycles of 23–35 days, to have had at least one live birth (or term stillbirth) within the preceding five years in the present union and to be cohabiting. Women were not eligible if they were lactating, if they had used hormonal contraception during any of the three cycles prior to admission into the study or if they had used the ovulation method previously. Participants had to agree to keep the necessary records and not to use any other method of contraception during the efficacy phase of the study.

Of 869 women admitted to a teaching phase of 3–6 cycles, 765 (88 percent) successfully completed it, and 725 entered the efficacy phase. (The remaining 40 withdrew for a variety of reasons; for example, because they wanted to get pregnant, were dissatisfied with the method or moved away.) The ovulation method rules, summarized in Table 1, forbid intercourse dur-

Table 2. Percentage of women using the ovulation method and percentage of cycles of use, by various demographic and method-related characteristics

Characteristic	%
WOMEN (N=725)	
Residence	
Auckland, New Zealand	14.1
Bangalore, India	26.3
Dublin, Ireland	26.9
Manila, Philippines	15.9
San Miguel, El Salvador	16.8
Age at admission (mean=29.8)	
<28	31.8
28–34	48.3
35–38	19.9
Perfect user (always obeys rules)	
Yes	54.1
No	45.9
Education	
Illiterate	12.4
<6 years	16.7
6–12 years	49.1
>12 years	21.8
Education of partner	
Illiterate	8.0
<6 years	17.7
6–12 years	39.4
>12 years	34.9
Occupation	
Housewife	83.2
Other	16.8
Occupation of partner	
Prof., tech., admin., clerical	32.7
Sales or service	12.6
Farming or skilled labor	45.1
Unskilled, student or unemployed	9.7
Number of previous pregnancies	
1–2	31.3
3–4	41.4
≥5	27.3
Attitude of partner*	
Fully cooperative	31.9
Attitude of partner (continued)	
Other	68.1
Partner completes charting*	
Always	8.6
Occasionally	25.1
Never	66.3
Couple took risk†	
Sometimes	38.0
Never	62.0
Couple took serious risk‡	
Sometimes	25.1
Never	74.9
CYCLES (N=7,484)	
Coital frequency per cycle (mean=4.88§)	
1–2	8.5
3–4	14.4
5–6	12.9
≥7	13.9
Unknown	50.2
Couple wants more children**	49.3
Woman prefers higher coital frequency	15.5
Partner prefers higher coital frequency	32.4
Attitude toward rules is excellent	30.2
Woman's satisfaction with method is excellent	21.7
Partner's satisfaction with method is excellent	21.7
Perfect use (obeys rules during cycle)	89.3
Couple took risk†	
In cycle	8.7
In previous cycle††	6.8
Two cycles previous‡‡	6.2
In both prior cycles§§	2.6
Couple took serious risk‡	
In cycle	4.1
In previous cycle*†	2.7
Two cycles previous*‡	2.3
In both prior cycles*§	0.7

*At graduation from teaching phase.

†Risk-taking defined as conscious breaking of any ovulation method rule. Rules are listed in Table 3.

‡Serious-risk taking defined as conscious breaking of the three most serious ovulation method rules forbidding intercourse during mucus/wet days, within three days after peak and during periods of stress.

§Mean for all cycles in which coital frequency is known.

**Not defined for women, because some women give different answers across cycles.

††When denominator is confined to those with two or more cycles, percent=7.6.

‡‡When denominator is confined to those with three or more cycles, percent=7.6.

§§When denominator is confined to those with three or more cycles, percent=3.2.

*†When denominator is confined to those with two or more cycles, percent=2.9.

*‡When denominator is confined to those with three or more cycles, percent=2.8.

*§When denominator is confined to those with three or more cycles, percent=0.9.

ing menses, on alternate "dry" days before the start of the fecund period (to minimize confusion between semen and cervical mucus), during the fecund period itself and during periods of stress. The fecund period begins with the onset of mucus secretion, peaks on the last day on which "fecund" mucus (resembling raw egg white) is recognized and ends on the evening of the third day past the peak day. Intercourse can be resumed on the fourth night past the peak day. Overall, intercourse is forbidden on roughly half the days in each cycle.

Separate data collection forms were used for each menstrual cycle, with each subject recording fecund days, days of bleeding and days of intercourse. Subjects were asked to record all acts of intercourse, but they were required to record, at a minimum, the last act before the onset of the fecund period, all acts during the fecund period, the first act after the end of the fecund period and whether all acts during the cycle were reported. From the form and a monthly meeting during which a teacher carefully questioned each subject, the teacher transcribed cycle details and judged compliance, comprehension and attitude. A total of 7,514 cycles were recorded for the 725 women. Copies of all forms were checked for consistency and completeness at WHO headquarters in Geneva, where an analysis file in machine-readable format was created.

One might object to our using the data from only the efficacy phase on the grounds that efficacy will be overstated because those most prone to fail would be eliminated in the teaching phase. We would agree with this criticism if we were interested in the overall proportion who fail during the first year of use. However, we reason that this selection process would operate primarily by weeding out imperfect users. Because the purpose of our analysis is to control for perfect vs. imperfect use (as well as for frequency of intercourse and age), we would not expect selection to be a factor. Moreover, the results published by WHO do not show any difference in the overall failure rates for the two phases.[17] There were 45 pregnancies in 2,701 cycles in the teaching phase (probability of failure = 0.0166 ± 0.0048) and 130 pregnancies in 7,514 cycles in the efficacy phase (probability of failure = 0.0173 ± 0.0029). Hence, the anticipated selection effect is not manifest in these data. Nevertheless, the primary reason that we have not included data from the teaching phase is practical rather than empirical or theoretical—they were not available to us.

In our analyses, we discarded 30 cycles during which, according to the women's reports, no intercourse had occurred; we retained 156 cycles about which there was insufficient information to determine whether intercourse had occurred. One might object that those who do not have intercourse in a cycle are nevertheless perfect users of the ovulation method. However, women simply are not exposed to the risk of contraceptive failure unless they have intercourse, so cycles characterized by no exposure to the risk of pregnancy should be removed.[18] Moreover, all qualitative results would be identical regardless of the inclusion or exclusion of these cases, and the quantitative impact of including the 30 cycles or excluding the 156 cycles is trivial. In all, 7,484 cycles were included in the analyses. We imputed perfect vs. imperfect use in a small number of cases for which data were missing, and we imputed coital frequency in a small number of cycles for which it was possible to do so.* The few cases for which data were missing on other variables were combined with the reference category for that variable. Consequently, effects estimates for these variables will be slightly attenuated.

Correlates of Failure

Our objective in the first of our analyses is to examine the characteristics of users of the ovulation method who experience a contraceptive failure. Our hypothesis is that three characteristics—perfect vs. imperfect use of the method, coital frequency and the underlying fecundity of the couple—are the dominant factors affecting contraceptive failure because they are the proximate biological determinants.[19] To study these characteristics, we use multivariate life tables or hazard models.†

The primary characteristic of interest is dichotomous: being a perfect or an imperfect user. We create two sets of models, each operationalizing this concept in a different way. The most straightforward is to classify as perfect users only those couples who always use the ovulation method perfectly. In the other procedure, couples are categorized as either perfect or imperfect users in each cycle; hence the cycle, not the couple, is characterized by either perfect or imperfect use. In the latter procedure, perfect use is a time-varying covariate. For example, a couple with perfect use in cycles 1 and 3 and imperfect use in cycles 2 and 4 would contribute cycles at durations 1 and 3 in the perfect-use life table and at durations 2 and 4 in the imperfect-use life table.

The second most important covariate is frequency of intercourse. Increased coital frequency raises the risk of contraceptive failure because exposure to the risk of failure is greater. Not only is there increased opportunity for imperfect use (at least with coitus-dependent methods), but also the risk of method failure rises with the number of occasions on which the method could fail. If effects of coital frequency are not controlled in studies of coitus-dependent methods (particularly periodic abstinence), method failure rates are likely to be low merely because low coital frequency is a good way to achieve perfect use. Imperfect users of the ovulation method are likely to have higher coital frequency on average because they have intercourse during the (roughly) half of the cycle when the ovulation method rules do not allow it as well as during the period when it is allowed. One of our goals is to separate the effects of imperfect use and coital frequency on method failure. Since coital frequency is not the same in each cycle, it is entered into the analyses as a time-varying covariate. However, complete information on all acts of coitus was provided for only half the cycles. Thus, when we categorized this variable, we were forced to include a category for unknown frequency.

A third important covariate is the underlying fecundity of the couple. Of course, fecundity is not observable. Fortunately, only women of proven fecundity were admitted to the WHO trial, so that the sample is, by design, relatively homogeneous on this dimension. We employ the age of the woman as a proxy for fecundity, because it will reflect the declining biological capacity to conceive as women age.[20]

We would expect that a model with these three covariates would adequately fit the data. However, a rich variety of other covariates, including socioeconomic characteristics and attitudinal measures, is available. We explore models with these additional characteristics to test our hypothesis that their importance in previous research reflects only the lack of data on the relevant biological proximate determinants. For example, the lower observed contraceptive failure rates among women who seek to prevent further pregnancies rather than to delay their next wanted pregnancy may simply reflect their greater consistency of use of a method and lower coital frequency.

Definitions of variables and their sample frequencies are displayed in Table 2. We provide frequencies for the sample of women when the information is woman-specific and for the sample of cycles when the information is cycle-specific. Age, coital frequency and number of previous pregnancies were coded as continuous variables by WHO (means for these variables are shown); for purposes of analysis, we categorized these variables. All other variables were categorized by WHO.

Preliminary life tables show a first-year failure probability of 3.1 percent among those who always used the ovulation method perfectly and of 38.4 percent among those who used the method imperfectly during at least one cycle. The probability of failure during the first year of perfect use (including the perfect-use cycles of the imperfect users) is 3.2 percent, which, as expected, is virtually identical to the result for those who always used the ovulation method perfectly. The probability of failure during the first year of imperfect use is 85.0 percent; this is a much higher probability (as expected) than that found for those who used the ovulation method imperfectly at least once (38.4 percent), because in the latter case, the likelihood of failure is reduced substantially by cycles of perfect use. This probability of failure is extremely high, almost as high as the proportion (about 89 percent) who conceive within one year of trying to become pregnant.[21] The ovulation method is very unforgiving of imperfect use.

Given these preliminary results, we confine attention henceforth to analyses in which perfect vs. imperfect use was defined for each cycle and not for each couple. Further analysis reveals that duration of use does not add significant explanatory power to these models. Hence, all cycles of use can be combined and a simple Pearl index (events divided by exposure) suffices for our purposes here. However, we emphasize that duration is important when the covariate perfect vs. imperfect use is omitted from the model, with failure rates declining as duration increases. Therefore, even these data should be analyzed with life-table procedures unless one controls for consistency and correctness of use. This warning would apply even more strongly if the data were not limited to only 13 cycles of exposure.

Table 3 (page 10) shows Pearl indices for various definitions of imperfect use. The overall probability of pregnancy is 1.7 percent per cycle—0.2 percent during cycles characterized by perfect use and 14.2 percent during those characterized by imperfect use. These failure probabilities per cycle can be cumulated to yield a 20.4 percent probability of failing during the first year; the estimated first-year probabilities of failing during perfect (3.1 percent) and imperfect (86.4 percent) use are nearly identical to the life-table probabilities (3.2 percent and 85.0 percent, respectively), because, as discussed previously, there is no significant variation in per-cycle rates by duration of use.

In Table 3, the first section under the heading "disobeyed rules" shows the risk of pregnancy when particular rules are broken, regardless of whether other rules

---

*Details concerning imputations are available from the first author.

†The number of failures, conditional on exposure, is assumed to be Poisson distributed with mean $N_i \exp(X_i\theta)$, where N_i is the exposure in group i, X_i is a vector of characteristics for group i and θ is the associated vector of regression coefficients.

Table 3. Number of pregnancies, number of cycles and percent failing during use of the ovulation method, by adherence to rules

Adherence to rules	Pregnancies	Cycles	% per cycle	% per year*	Confidence interval†
TOTAL	130	7,484	1.7	20.4	17.2–23.4
Obeyed rules	16	6,683	0.2	3.1	1.6–4.5
Disobeyed rules	114	801	14.2	86.4	80.5–90.6
Broke this rule and perhaps others					
Consecutive dry days	13	218	6.0	55.0	31.1–71.1
Mucus/wet days	62	178	34.8	99.6	98.6–99.9
Three days after peak	47	209	22.5	96.4	90.9–98.6
Genital contact on wet days	9	106	8.5	68.4	34.3–85.5
Bleeding/spotting	9	232	3.9	40.2	16.7–57.5
Situations of stress	23	41	56.1	100.0	99.9–100.0
Broke only this rule					
Consecutive dry days	5	155	3.2	34.7	5.6–55.3
Mucus/wet days	28	91	30.8	99.2	95.5–99.9
Three days after peak	26	128	20.3	94.8	84.5–98.4
Genital contact on wet days	1	75	1.3	16.0	0.0–40.6
Bleeding/spotting	2	157	1.3	15.4	0.0–33.0
Situations of stress	3	8	37.5	99.8	68.6–100.0‡
Broke any of these rules (and perhaps others)					
Wet days, after peak, or stress	104	375	27.7	98.5	96.8–99.4
All others	10	426	2.3	26.6	11.2–39.4
Wet days, after peak, or consecutive dry	105	539	19.9	94.0	89.9–96.6
All others	9	262	3.4	36.5	14.9–53.0
Wet days, after peak, consecutive dry, or stress	109	548	19.9	94.4	90.5–96.8
All others	5	253	2.0	22.9	3.3–38.7

*Calculated as $100x(1-[1-P]^{13})$, where P is the probability per cycle (# pregnancies/# cycles).

†Annual 95% confidence interval computed from cycle confidence interval based on normal approximation.

‡Annual 95% confidence interval computed from cycle confidence interval based on exact binomial.

are broken simultaneously. The second section displays the risk when only one rule is broken. These results suggest that having intercourse is particularly risky on mucus days, during the three days after the peak day or during periods of stress; in the remainder of this article, prohibitions against having intercourse under those conditions will be referred to as the three most serious rules. Among those whose imperfect use consists of breaking one or more of these three rules in every cycle, 98.5 percent would become pregnant in the first year. In contrast, having intercourse during the menstrual period or having "genital contact" during mucus days carries far less risk; having intercourse on consecutive dry days incurs a risk intermediate between the very high risk and lower risk behaviors.

It is surprising that having intercourse during times of stress incurs such a high risk. Stress presumably disrupts the link between changes in the quality of cervical mucus and ovulation. A plausible hypothesis is that stress delays ovulation but not the estimated peak fecund day, which is identified retrospectively as the last day on which slippery mucus is observed. Hence, when intercourse is timed according to the ovulation method rules to resume on or soon after the evening of the fourth day past the estimated peak, the timing actually coincides with the period of maximum risk of conception. Further research is needed to discover whether having intercourse during periods of stress is indeed as risky as our results imply and, if so, why.

In Figure 1, we use results from Table 3 to simulate the probability of contraceptive failure within one year, depending on the number of cycles in which the ovulation method is used imperfectly. For illustrative purposes, we focus on three types of imperfect use: serious imperfect use (breaking one or more of the three most serious rules), which incurs a risk of 27.7 percent per cycle; less serious imperfect use (breaking rules other than the three most serious ones), which incurs a risk of 2.3 percent per cycle; and typical imperfect use (in which the mix of broken rules mirrors that in the WHO trial), which incurs a per-cycle risk of 14.2 percent. When the only imperfect use is of the less serious variety, the probability of accidental pregnancy per year rises almost linearly from 5.1 percent (if only one use cycle is imperfect) to 26.6 percent (if all 13 cycles are characterized by imperfect use). For the other two varieties of imperfect use, the corresponding curves rise much more rapidly when the number of imperfect-use cycles is small than when the number is already large, because the per-cycle risks are so large. Stated in a different way, with only two cycles of serious imperfect use (49.1 percent) or with only four cycles of typical imperfect use (47 percent), the yearly probability of failure reaches about one-half what it is after 13 cycles of serious imperfect use or typical imperfect use.

Our next step is to test the hypothesis that in addition to perfect vs. imperfect use, only age and coital frequency would be significant explanatory variables of failure for the ovulation method. Exploratory analysis revealed that separate models should be estimated for perfect use, for all imperfect use and for serious imperfect use (when one or more of the three most serious rules were broken). The most surprising finding is that for each of these use groups in models including only age and coital frequency as explanatory variables, coital frequency never adds significant explanatory power.

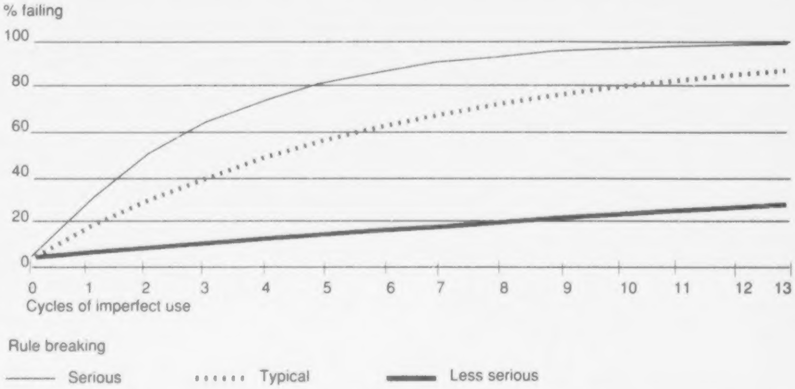
That finding is not simply the result of a reduction in the precision of the effects estimates caused by the lack of information on coital frequency during those cycles for which women did not record all acts (about half the total number of cycles). In addition to the fact that the effects estimates were almost never significantly different from zero, the results for coital frequency categories 1–2, 3–4, 5–6 and 7 or more times per cycle showed no consistent pattern.* Moreover, responses to an auxiliary question on average frequency of intercourse per week, which are missing much less often, yield equally inconsistent results. We are unwilling, however, to abandon our hypothesis that increased frequency of intercourse will result in a greater likelihood of failure and believe that the results raise suspicions about the accuracy of reporting of coital frequency.

Next, to discover which of the variables shown in Table 2 were significant predic-

---

*Coital frequency is significant in a model in which it is the only covariate. However, even in this model, the effect estimates for 3–4 times per cycle and seven or more times per cycle are not significantly different from the effect estimate for 1–2 times per cycle. Only the effect estimate for 5–6 times per cycle is significant, and it is significantly lower (not higher) than the effect estimates for the other three categories.

Figure 1. Annual probability of failure of the ovulation method, by type of rule breaking, according to number of cycles of imperfect use



Notes: Annual probability of failure calculated as $1-[(1-P_p)^{13-n}(1-P_i)^n]$, where n is the number of cycles of imperfect use and P_p and P_i are the per-cycle probabilities of failure during perfect and imperfect use. $P_p = 0.0024$; P_i takes the values 0.277 for serious imperfect use, 0.023 for less serious imperfect use and 0.142 for typical imperfect use. Serious imperfect use means breaking any of the rules forbidding intercourse on wet days, within three days after peak or during stress. Less-serious imperfect use means breaking any ruie in Table 3 other than those three. Typical imperfect use means breaking any ovulation method rule, with the mix of rules broken mirroring the experience of women in the WHO trial.

tors of failure, we added them sequentially to the models that included age and coital frequency. Only one variable—country of residence—proved important. Country-specific predicted probabilities of failure during the first year are shown in Table 4. During perfect use, there were no failures reported by women in India or El Salvador. Further tests revealed that among the remaining women, failure rates during perfect use did not differ between those aged 28–34 and those 35 and older or between women in New Zealand and those in Ireland. Also, further tests revealed that for both imperfect use and serious imperfect use, pooling the experiences of women from New Zealand, Ireland and the Philippines resulted in no loss of explanatory power. Moreover, age added no explanatory power during serious imperfect use.

We are troubled that the probability of failure during perfect, imperfect and serious imperfect use is affected by country of residence. This variable undoubtedly reflects cultural differences in reproductive and sexual behavior and may be serving as a proxy for real differences in coital frequency and the underlying fecundity of those who chose to participate in the trial. However, the finding may also simply reveal cultural differences in misreporting of rule breaking. We are dissatisfied with this result precisely because it is so difficult to interpret; furthermore, we reason that location should not matter if the proximate determinants are properly measured.

Risk Takers and Non–Risk Takers

In this part of our analysis, we examine risk-taking behavior itself, because it is such a central issue in the success or failure of the ovulation method. Because we are concerned with risk-taking and not with imperfect use resulting from poor understanding of the ovulation method, we will focus on conscious deviations from the ovulation method rules. We embed our investigation in the analytical framework constructed by Kristin Luker, who argues that women who take contraceptive risks lack neither information (as contraceptive ignorance theory implies) nor rationality (as intrapsychic conflict theory implies).[22] She argues instead that women are constantly bargaining tacitly with themselves "to determine the costs and benefits of contraception, the costs and benefits of pregnancy, the likelihood that pregnancy will occur" and the possibility that pregnancy can be terminated.[23]

Given the widespread appeal of this theory, the relative dearth of empirical tests of its validity is surprising. An analysis of data from a study of 221 sexually active female college students found that risk-taking is not affected by the subjective expected benefits and costs of contraceptive use and pregnancy or the subjective likelihood of abortion.[24] It did support other research that identifies the woman's belief in her chances of becoming pregnant as an important determinant of risk-taking. The analysis concludes that Luker's theory does not work because people are simply unable to choose consistently when faced with even moderate complexity or uncertainty.

We find these results unconvincing, however, because the investigators' measures of both risk-taking and past risk-taking are so limited. Risk-taking was measured by a question on the number of times during the past month that intercourse occurred without contraceptive use. Responses were retrospective, pertained to only one month and did not distinguish unprotected coitus at midcycle from unprotected acts of intercourse at less risky times. The only measure of past risk-taking was "having ever been pregnant," with no distinction between intended and unintended pregnancies. A second study, which does not suffer from the same defi-

Table 4. Percent failing during use of the ovulation method, by type of use and woman's age, according to country

Type of use and woman's age	Ireland and New Zealand		India		El Salvador		Philippines	
	Per cycle	Per year	Per cycle	Per year	Per cycle	Per year	Per cycle	Per year
Perfect use*								
≤27	1.4	17.2	0.0	0.0	0.0	0.0	0.2	2.0
≥28	0.4	5.4	0.0	0.0	0.0	0.0	0.0	0.6
Imperfect use†								
≤27	12.6	82.5	46.0	100.0	86.9	100.0	12.6	82.5
28–34	7.7	64.6	30.7	99.1	70.1	100.0	7.7	64.6
35–38	3.9	40.5	16.8	90.8	45.4	100.0	3.9	40.5
Serious imperfect use‡								
All ages	15.3	88.5	70.9	100.0	70.9	100.0	15.3	88.5

*Goodness of fit: X^2 against saturated model=5.53 with 11 degrees of freedom; p=0.90.

†Goodnes of fit: X^2 against saturated model=11.21 with 10 degrees of freedom; p=0.34.

‡Goodness of fit: X^2 against saturated model=15.95 with 13 degrees of freedom; p=0.25.

ciencies, analyzed data gathered prospectively over a three-year period from approximately 1,000 18–27-year-old women living in the San Francisco area.[25] It found that perceived attitudes toward pregnancy and contraception and the perceived risk of conception were related in the expected manner to consistency of contraceptive use.

Although we cannot execute a strict empirical test of Luker's theory, we instead use it to frame our expectations. The WHO investigators did not collect all the information pertinent to Luker's model, particularly information on attitudes toward abortion. However, given that only 3.7 percent of pregnancies were aborted, 83 percent of all subjects were Catholic and 41 percent of subjects chose the ovulation method specifically for religious reasons, it is likely that most women in the WHO trial did not view terminating a pregnancy as a realistic option.

Using logit regression,[*] we explore which subgroups of the population are more likely to take risks by consciously breaking the ovulation method rules. We would expect that those who themselves or whose partners desire intercourse more frequently than the ovulation method rules allow and those who themselves or whose partners are more dissatisfied with the method would be more likely to take a risk: These are the couples who would perceive the benefit of using the ovulation method as low. We would expect that couples who definitely want no more children (limiters) would be less likely to take risks than would those who seek to delay the next wanted birth (spacers), because limiters would assign higher cost to pregnancy than would spacers. For similar reasons, we would expect that older women and those whose partners are not regularly employed would be less likely to take risks.

Because all women in the study had conceived and delivered at least one child, all were aware that they were fecund. Given the intensive training period in the ovulation method trial, one might expect that all subjects would have a common (although, given the results in the previous section, perhaps not entirely realistic) perception of the risk of pregnancy should the ovulation method rules be broken. One might reason further that couples would perceive that breaking some rules (such as no intercourse during menses) is less likely to lead to pregnancy than is breaking other rules (such as no intercourse during slippery-mucus days). Specifically, educated couples might be more likely to take "innocuous" risks.

Fortunately, the WHO data for the ovulation method are detailed enough that we can explore alternative definitions of risk-taking (ranging from consciously breaking any rule to breaking the most serious rules). Luker strongly objects to the notion that women can be immutably classified as either successful or unsuccessful contraceptive users and that these two types can be differentiated by emotional maturity, future time perspectives or results on standardized psychological tests. She stresses that women constantly interpret facts about "average" women in light of their own unique experience. Thus, for women who take risks and do not become pregnant, risk-taking behavior is reinforced.

Our analysis avoids the strict dichotomous classification to which Luker objects by modeling the "dynamic updating" process that she describes. Instead of using the woman as the unit of observation, our unit of analysis will be a cycle of use, with each woman contributing up to 13 observations.[†] We model the dynamic updating process by including "got away with taking a risk last cycle" and "got away with taking a risk in the next-to-last cycle" as dichotomous covariates. More complex information on past behavior could easily be incorporated, but these two measures should be sufficient to produce clinically useful information. Note that a finding that prior risk-taking is associated with subsequent risk-taking does not necessarily confirm the Luker dynamic updating hypothesis because one would also find such an association if there were a couple-specific effect (propensity to take risks) that is constant over time but varies across couples. Nevertheless, for clinical purposes, what matters more is that past risk-taking predicts future risk-taking; those who take risks can be warned of the consequences, regardless of why they take risks.

With complete data, one might distinguish empirically a couple-specific effect from a dynamic updating process whereby couples who take a risk in the current cycle increase their propensity to take a subsequent risk if pregnancy does not occur but decrease their propensity if pregnancy does occur. In contrast to dynamic updating, couple-specific effects imply that the probability of further risk-taking is independent of whether pregnancy occurred during risk-taking. Under our sampling scheme, however, those who become pregnant disappear from observation. Hence, distinguishing between the two hypotheses becomes more difficult. Nevertheless, the competing hypotheses imply two differing properties that suggest formal tests. First, if only dynamic updating operates, the fraction taking risks should increase over time; if only a couple-specific effect is present, the fraction taking risks will decrease over time as those with the greatest probability of taking risks are removed from the sample by pregnancy. Second, under dynamic updating, the likelihood of taking a first risk should be constant over time, whereas with couple-specific effects the probability of taking a first risk should diminish as time passes, again because of selection. It is likely that both processes (selection and updating) operate, thereby making an assessment of their relative contributions less precise.

It is possible that other socioeconomic and demographic characteristics are associated with risk-taking, so we examine these less proximate determinants as well. The descriptive statistics for potential explanatory variables are displayed in Table 2. We first examined the predictors of any forms of conscious risk-taking, regardless of whether serious or less serious rules were broken; although rules were broken in 801 cycles, they were consciously broken in only 654 cycles. The upper half of Table 5 (page 14) presents our final model, which contains only the variables that add significant explanatory power. When variables have fewer categories than are shown in Table 2, tests revealed that collapsing categories did not result in significant loss of explanatory power.

---

[*] The probability P_i that couples in group i will take a risk is expressed as $P_i=[1+\exp(-X_i'\beta)]^{-1}$, where X_i is a vector of characteristics for group i and β is the associated vector of regression coefficients. It can be verified that the logit or log-odds is a linear combination of the predictors: $\log_e[P_i/(1-P_i)]=X_i'\beta$.

[†] One might object to this strategy because of the expectation that there will be an effect for each couple, so that cycles cannot be analyzed as if they were independent observations. In fact, we have two strata: the cycle and the couple. We stress, however, that we do not assume that cycles are independent because we incorporate variables measuring prior risk-taking (lags) in our model. Another approach would be to include a couple-specific fixed effect in a conventional logit analysis, but doing so would entail the estimation of hundreds of nuisance parameters. A preferable alternative is to assume that the couple-specific effect is random. Then one must estimate only the parameters of the distribution assumed for the unobservable couple-specific effect (or the distribution may be left unspecified and estimated by nonparametric maximum likelihood [see: D. Follmann and D. Lambert, "Generalizing Logistic Regression by Nonparametric Mixing," *Journal of the American Statistical Association*, **84**:295, 1989]). Our intuition is that results from a random-effects model are likely to be very similar to and no more clinically useful than results from our model incorporating lags.

Most results conform to expectations. The likelihood of taking a risk is raised by an increase in coital frequency (but not by a desire for greater coital frequency—not shown since not significant*), by a desire for more children eventually or by taking a risk in either the last or the next-to-last cycle. Although taking a risk in both the last and the next-to-last cycle increases the probability of taking a risk, as a result of a significant negative interaction between these two variables, the increase in the log-odds is less than the sum of the main effects of risk-taking in each of the two previous cycles. Having an excellent attitude toward the ovulation method rules lowers the probability of taking a risk. Unexpectedly, having a partner who is unemployed or unskilled or who is a student raises the odds of taking a risk.

Country of residence is a factor with great explanatory power. Couples in New Zealand were most likely to take risks, followed by those in Ireland, those in the Philippines, those in El Salvador and those in India. The range is quite large; the odds of taking a risk for couples in New Zealand were nearly 42 times the odds for couples in India.

It is possible, however, that couples who are more likely to take risks take only less serious risks. To answer that question, we focus on serious risk-taking, which includes knowingly violating the three most serious rules—those forbidding intercourse during mucus days, during the three days after the peak and during times of stress. Although these serious rules were broken in 375 cycles, they were consciously broken in only 306 cycles. Although we know that breaking these three rules incurs the greatest risk of pregnancy, couples may not have this knowledge; hence, they may not be consciously breaking the rules they know to be most important. In the bottom half of Table 5, we show the likelihood of taking a serious risk for only those variables that contributed significant explanatory power. As before, when variables have fewer categories than are shown in Table 2, collapsing categories did not result in significant loss of explanatory power.

The results are broadly similar to those shown for all types of risk-taking. The probability of taking a serious risk increases with coital frequency (although there is no difference in the effects of frequencies of 3–6 and seven or more per cycle), but, as before, not when the woman desires greater frequency (not shown since not significant). The probability of serious risk-taking, unlike that of risk-taking overall, is not affected by a desire for more children but is affected by the age and education of the woman. Older women, literate women and women having an excellent attitude toward the ovulation method rules are less likely to take serious risks. As before, the probability of taking a serious risk increases when a serious risk was taken either in the last or in the next-to-last cycle. Moreover, unlike the case with any risk-taking, the log-odds of taking a serious risk when a serious risk was taken in both preceding cycles is increased by the sum of the separate main effects; there is no significant negative interaction. Having a partner who is unemployed, an unskilled laborer or a student raises the probability of taking a serious risk. The pattern by country of residence of the probability of taking serious risks is the same as that for taking any risks. In fact, the relative odds are very similar, except for the couples in New Zealand, whose odds of taking a serious risk, when compared with the odds for other couples, are only about half their odds of taking any risk.

Finally, there is no direct evidence of the dynamic updating process postulated by Luker (results not shown). The fraction of couples taking risks declines as time passes, even after the effects of all factors except prior risk-taking are controlled. This pattern is evident both for any risk-taking and for serious risk-taking, although the declines are not significant in either case.† The conditional probability of taking a first risk also declines over time, even after the effects of predictors other than prior risk-taking are controlled. This decline is significant both for any risks and for serious risks. These findings are consistent with selection resulting from unobserved couple-specific effects but are inconsistent with a dynamic updating process. Dynamic updating may well occur, but if so, it is dominated by selection.

A comparison of the two different types of risk-taking yields a number of insights. Wanting more children raises the probability that couples will take risks, but not serious risks. Older and more educated women are as likely as younger and uneducated women to take risks, but the risks they take are the less serious ones. Greater coital frequency, a poor attitude toward the ovulation method rules or having a partner who is unemployed or unskilled or who is a student increases the odds of taking risks in general as well as the odds of taking serious risks; moreover, the odds for these characteristics are about the same for both types of risk-taking. Taking a risk in the previous two cycles increases the odds of taking a risk in the current cycle by a factor of 7.6; taking a serious risk in the previous two cycles increases the odds of taking a serious risk in the current cycle to a far greater extent—a factor of 17.6 (not shown).

It is quite interesting that country of residence so heavily influences the likelihood of taking any risk and the likelihood of taking serious risks, and that the rank order by country is the same for both types of risks. Do these findings simply reflect differences in cultural attitudes toward risk-taking? Or do they suggest differences in the types of couples in each setting who would choose to use the ovulation method or pronounced differences in what the subjects actually learned from their instructors (or what actually was taught)? Or do they reveal differences in misreporting of imperfect use? Further research is needed to answer these questions.

Two variables deserve further discussion. First, the effect of prior risk-taking is understated in Table 5 because no couple could have taken a risk before the first cycle and no couple could have taken a risk two cycles before the first or second cycle. Reestimation of these models after we had discarded the first two cycles confirms that the effect of prior risk-taking is even more pronounced; taking a risk in the two previous cycles increases the odds of taking a risk in the current cycle by factors of 8.7 and 18.4 in models of risk-taking and serious risk-taking, respectively. Second, it is not clinically useful to know that displaying a poor attitude toward the ovulation method rules at the end of a cycle is associated with increased risk-taking in that cycle; indeed, the causation is probably reversed (i.e., taking a risk sours one's attitude). Hence, we reestimated the models (after discarding the first cycle) to see whether a poor attitude toward the ovulation method rules in the previous cycle predicts risk-taking in the current cycle. The results confirm that a

---

*It is likely that this variable captures two opposite effects. On the one hand, those who desire coitus more frequently might break the rules to approach their desired target. On the other hand, those who obey the rules might be the ones who desire greater coital frequency, whereas those who break the rules attain their desired frequency. A more useful question would have explicitly asked whether the woman (or her partner) desires coitus more frequently *than the rules allow*.

†A poor attitude toward ovulation method rules may be the consequence rather than the cause of risk-taking. When the effect of this factor is not controlled, the decline for any risk-taking becomes significant, but the decline for serious risk-taking remains insignificant.

Table 5. Among users of the ovulation method, effects estimates and odds ratios of taking a risk during a cycle, by type of risk-taking and characteristics of user

Type of risk-taking and characteristic	Effects estimate	Standard error	Odds ratio
Any risk-taking*			
Intercept	−2.59	0.13	na
Coital frequency 1–2 or unknown per cycle†			
Coital frequency 3–6 per cycle	0.26	0.12	1.30
Coital frequency ≥7 per cycle	0.72	0.14	2.05
Couple wants no more children†			
Couple eventually wants more children	0.25	0.10	1.28
Partner is not unemployed, unskilled or a student†			
Partner is unemployed, unskilled or a student	0.82	0.18	2.27
Attitude toward rules is not excellent†			
Attitude toward rules is excellent	−2.32	0.14	0.10
Couple did not take risk last cycle†			
Couple took risk last cycle	1.63	0.15	5.12
Couple did not take risk two cycles ago†			
Couple took risk two cycles ago	1.04	0.17	2.83
Couple did not take risk in both of last two cycles†			
Couple took risk in both of last two cycles	−0.64	0.27	7.61‡
Dublin, Ireland†			
Bangalore, India	−1.70	0.19	0.18
Auckland, New Zealand	2.02	0.14	7.50
San Miguel, El Salvador	−0.90	0.22	0.41
Manila, Philippines	−0.29	0.14	0.75
Serious risk-taking§			
Intercept	−2.38	0.32	na
Coital frequency 1–2 or unknown per cycle†			
Coital frequency ≥3 per cycle	0.49	0.14	1.64
Woman aged ≤34 years†			
Woman aged ≥35 years	−0.66	0.18	0.52
Woman is illiterate†			
Woman is literate	−0.68	0.27	0.51
Partner is not unemployed, unskilled or a student†			
Partner is unemployed, unskilled or a student	0.79	0.23	2.20
Attitude toward rules is not excellent†			
Attitude toward rules is excellent	−2.42	0.23	0.09
Couple did not take serious risk last cycle†			
Couple took serious risk last cycle	1.77	0.20	5.89
Couple did not take serious risk two cycles ago†			
Couple took serious risk two cycles ago	1.10	0.23	3.00
Dublin, Ireland†			
Bangalore, India	−1.55	0.25	0.21
Auckland, New Zealand	1.39	0.18	4.00
San Miguel, El Salvador	−0.52	0.29	0.59
Manila, Philippines	−0.29	0.19	0.75

*Goodness of fit: X^2 against saturated model=1,838.0 with 1,999 degrees of freedom; $p=0.99$. Risk-taking is defined as consciously breaking any rules in Table 3.

†Reference category in logit regression.

‡Includes both main effects and the interaction; OR = exp (1.63+1.04−0.64).

§Goodness of fit: X^2 against saturated model=1,244.6 with 1,734 degrees of freedom; $p=1.00$. Serious risk-taking is defined as consciously breaking the three most serious rules, which forbid intercourse during mucus/wet days, within three days after peak and during periods of stress.

Notes: All effects estimates and odds ratios significant at $p<0.01$ using the appropriate one-tailed test, with the following exceptions: In the model for any risk-taking, those for Manila were significant at $p<0.05$, and in the model for serious risk-taking, those for San Miguel were significant at $p<0.05$ and those for Manila were not significant; na=not applicable.

poor attitude is a clinically powerful predictor of subsequent risk-taking overall and of serious risk-taking in particular, although the odds are increased by only about 50 percent in the two models (compared with a 10-fold increase in Table 5). We note that the effects estimates for other factors in each of these alternative models do not differ from the effects estimates reported in Table 5.

Conclusion

We strongly suspect that all methods of periodic abstinence will prove to be more unforgiving of imperfect use than will other methods of contraception, because breaking the rules of periodic abstinence involves having unprotected intercourse at times during the menstrual cycle when pregnancy is most likely to occur. The pill is probably the most forgiving (because forgetting to take a pill even in midcycle will not necessarily result in ovulation, much less pregnancy); barrier methods are likely to be less forgiving of imperfect use than the pill but more forgiving than periodic abstinence. Consequently, we believe that method failure rates for periodic abstinence computed by the standard (but incorrect) procedure are less likely to be underestimated than are those for other methods of contraception. User failure rates for periodic abstinence computed by the standard procedure, in contrast, are grossly underestimated.

Four results from this study should be clinically useful in counseling couples about the ovulation method. First and foremost, the efficacy of the ovulation method is high when used correctly and consistently, but the ovulation method is very unforgiving of imperfect use. Second, having intercourse during periods of stress is very risky (contrary to our expectations). Third, those who have a poor attitude toward the rules are likely to take risks, including serious risks. Fourth, those who get away with taking a risk are very likely to take risks, including serious risks, again. Breaking the most serious rules entails a 28 percent risk of pregnancy per cycle. Hence, those who are likely to take risks should be counseled about the serious consequences. Unfortunately, the last result is not helpful in identifying which couples are prone to take risks in their first cycle of use. Nevertheless, it does highlight the importance of a teaching phase during which couples are monitored closely for the first few cycles.

Fortunately, imperfect use is not very common (11 percent of cycles) and serious imperfect use is even less common (five percent of cycles). However, 46 percent of women broke an ovulation method rule (were imperfect users) and 31 percent broke a serious ovulation method rule (were serious imperfect users) in at least one cycle. Moreover, imperfect use is likely to be more common among couples who do not receive intense training and support such as that provided in the WHO clinical trial. Therefore, the ovulation method cannot be regarded as a reasonable contraceptive choice for all women or couples; most would find abstaining for nearly half of each menstrual cycle unacceptable. For this reason, Josef Roetzer, the pioneer of the sympto-thermal variant of periodic abstinence, stresses that "natural conception regulation" is not contraception, but a way of life.[26]

References

1. J. Trussell and K. Kost, "Contraceptive Failure in the United States: A Critical Review of the Literature," *Studies in Family Planning*, **18**:237, 1987.

2. World Health Organization (WHO), "A Prospective Multicentre Trial of the Ovulation Method of Natural Family Planning. I. The Teaching Phase," *Fertility and Sterility*, **36**:152, 1981; ——, "A Prospective Multicentre Trial of the Ovulation Method of Natural Family Planning. II. The Effectiveness Phase," *Fertility and Sterility*, **36**:591, 1981; ——, "A Prospective Multicentre Trial of the Ovulation Method of Natural Family Planning. III. Characteristics of the Menstrual Cycle and of the Fertile Phase," *Fertility and Sterility*, **40**:773, 1983; ——, "A Prospective Multicentre Trial of the Ovulation Method of Natural Family Planning. IV. The Outcome of Pregnancy," *Fertility and Sterility*, **41**:593, 1984; and ——, "A Prospective Multicentre Trial of the Ovulation Method of Natural Family Planning. V. Psychosexual Aspects," *Fertility and Sterility*, **47**:765, 1987.

3. WHO, "I. The Teaching Phase," 1981, op. cit. (see reference 2).

4. ——, "II. The Effectiveness Phase," 1981, op. cit. (see reference 2).

5. ——, 1987, op. cit. (see reference 2).

6. J. Trussell and K. Kost, 1987, op. cit. (see reference 1); and J. Trussell, D. Bloom and A. Pebley, "Correcting Contraceptive Failure Rates for Sample Composition and Sample Selection Bias," *Social Biology*, **28**:293, 1981.

7. M. C. Weissmann et al., "A Trial of the Ovulation Method of Family Planning in Tonga," *Lancet*, **II**:813, 1972.

8. J. Marshall, 'Ovulation Method of Family Planning," letter to the editor, *Lancet*, **II**:1027, 1972

9. R. Rochat, "Ovulation Method of Family Planning," letter to the editor, *Lancet*, **II**:1027, 1972.

10. H. Mosley, "Ovulation Method of Family Planning," letter to the editor, *Lancet*, **II**:1028, 1972.

11. M. Ball, "A Prospective Field Trial of the 'Ovulation Method' of Avoiding Conception," *European Journal of Obstetrics, Gynecology and Reproductive Biology*, **6**:63, 1976; P. J. Bartzen, "Effectiveness of the Temperature Rhythm System of Contraception," *Fertility & Sterility*, **18**:694, 1967; L. Dolack, "Study Confirms Values of Ovulation Method," *Hospital Progress*, **59**:64, 1978; J. A. Johnston, D. B. Roberts and R. B. Spencer, *A Survey Evaluation of the Efficacy and Efficiency of Natural Family Planning Services and Methods in Australia: Report of a Research Project*, St. Vincent's Hospital, Sydney, Australia, 1978; R. Kambic et al., *A 30-Month Clinical Experience in Natural Family Planning: Some Client Characteristics and Effectiveness in Avoiding Pregnancies*, St. Joseph Hospital, Lancaster, Pa., 1981; H. Klaus et al., "Use-Effectiveness and Client Satisfaction in Six Centers Teaching the Billings Ovulation Method," *Contraception*, **19**:613, 1979; A. Perez et al., "Use-Effectiveness of the Ovulation Method Initiated During Postpartum Breastfeeding," *Contraception*, **38**:499, 1988; F. J. Rice, C. A. Lanctot and C. Garcia-Devasa, "Biological Effectiveness of the Sympto-Thermal Rhythm Method: An International Study. A Preliminary Report," *Acta Medica Romana*, **16**:349, 1978; M. C. Weissmann et al., 1972, op.cit. (see reference 7); and WHO, "The Effectiveness Phase," 1981, op.cit. (see reference 2).

12. H. Dubrow and K. Kuder, "Combined Postpartum and Family Planning Clinic," *Obstetrics & Gynecology*, **11**:586, 1958; E. Mears and N. W. Please, "Chemical Contraceptive Trial," *Journal of Reproduction and Fertility*, **3**:138, 1962; A. P. K. John, "Contraception in a Practice Community," *Journal of the Royal College of General Practitioners*, **23**:665, 1973.

13. E. Mears and N. W. Please, 1962, op. cit. (see reference 12); and A. P. K. John, 1973, op. cit. (see reference 12).

14. H. Dubrow and K. Kuder, 1958, op. cit. (see reference 12).

15. D. A. McClure and D. A. Edelman, "Worldwide Method Effectiveness of the Today® Vaginal Contraceptive Sponge," *Advances in Contraception*, **1**:305, 1985.

16. S. L. McIntyre and J. E. Higgins, "Parity and Use-Effectiveness with the Contraceptive Sponge," *American Journal of Obstetrics and Gynecology*, **155**:796, 1986; and J. Trussell, "Reply to Edelman," *Contraceptive Technology Update*, **10**:65, 1989.

17. WHO, "I. The Teaching Phase," 1981, op. cit. (see reference 2).

18. B. Vaughan et al., "Contraceptive Failure Among Married Women in the United States, 1970–1973," *Family Planning Perspectives*, **9**:251, 1977; A. L. Schirm et al., "Contraceptive Failure in the United States: The Impact of Social, Economic and Demographic Factors," *Family Planning Perspectives*, **14**:467, 1982; and W. R. Grady, M. D. Hayward and J. Yagi, "Contraceptive Failure in the United States: Estimates from the 1982 National Survey of Family Growth," *Family Planning Perspectives*, **18**:200, 1986.

19. J. Trussell and K. Kost, 1987, op. cit. (see reference 1).

20. J. Menken, J. Trussell and U. Larsen, "Age and Infertility," *Science*, **233**:1389, 1986.

21. J. Trussell and K. Kost, 1987, op. cit. (see reference 1).

22. K. Luker, *Taking Chances*, University of California Press, Berkeley, 1975.

23. Ibid., p. 85.

24. P. Crosbie and D. Bitte, "A Test of Luker's Theory of Contraceptive Risk-Taking," *Studies in Family Planning*, **13**:67, 1982.

25. W. Miller, "Why Some Women Fail to Use Their Contraceptive Method: A Psychological Investigation," *Family Planning Perspectives*, **18**:27, 1986.

26. J. Roetzer, personal communication, Jan. 2, 1990.

Resumen

Todas las estadísticas de falla de método o usuaria publicadas anteriormente adolescen de un grave error metodológico que produce una subestimación indeterminada. Para efectuar los primeros cómputos correctos de la eficacia de método y usuaria y determinar las características que distinguen a las mujeres que corren conscientemente riesgos de las que no, se utilizaron los datos obtenidos por la Organización Mundial de la Salud a raíz de una prueba clínica del método de ovulación de abstinencia periódica. Las probabilidades de que la mujer quede embarazada durante el primer año son del 3,1 por ciento con un uso perfecto (falla del método) y del 86,4 por ciento con un uso imperfecto (falla de la usuaria). De manera que, de emplearse perfectamente, el método de ovulación resulta sumamente eficaz. Es, sin embargo, tremendamente implacable cuando no se aplica correctamente. Dado que a muchas parejas que desean tener relaciones cuando el método lo prohíbe les resulta difícil aplicarlo al pie de la letra, y por cuanto el riesgo de embarazo en esas condiciones es tan elevado, el método de ovulación no puede considerarse anticonceptivo ideal para la pareja típica, que seguramente no ha de respetar tanto las reglas como las que se ofrecen voluntarias para pruebas clínicas. Las mayores probabilidades de embarazo accidental ocurren cuando se quebranta cualquiera de las reglas básicas: abstinencia durante los días de secreción de la mucosa, durante los tres días posteriores a la fecundidad máxima o en momentos de tensión. Las mujeres que adoptan una actitud irresponsable frente a las reglas son más propensas a correr riesgos, incluso graves. Quienes corren el riesgo y no sufren consecuencias (es decir que no quedan embarazadas) de seguro volverán a hacerlo. Como quebrantar las reglas fundamentales entraña riesgos del 28 por ciento por ciclo, es necesario advertir de las consecuencias a las mujeres propensas a correrlos.

Résumé

Les estimations, publiées auparavant, de probabilités d'échec de méthode et d'utilisatrice pour toutes les méthodes contraceptives souffrent d'une grave erreur méthodologique et sont déformées vers le bas, l'étendue de la déformation étant inconnue. Des données, tirées d'un essai clinique effectué par l'Organisation mondiale de la santé sur la méthode d'abstinence périodique, ont été utilisées pour obtenir les premières mesures, calculées correctement, de l'efficacité de la méthode et de l'utilisatrice, et pour déterminer les caractéristiques distinguant les femmes qui prennent consciemment des risques de celles qui ne le font pas. Les probabilités de grossesse durant la première année sont de 3,1 pour cent lors d'une utilisation parfaite (échec de la méthode) et de 86,4 pour cent lors d'une utilisation imparfaite (échec de l'utilisatrice). Si elle est utilisée à la perfection, la méthode d'ovulation est donc très efficace. Elle est, cependant, très impitoyable pour l'utilisation imparfaite. Etant donné que l'observance parfaite est difficile pour un grand nombre de couples qui désirent avoir des rapports lorsqu'ils sont interdits suivant les règles de la méthode d'ovulation, et étant donné que le risque de grossesse durant l'utilisation imparfaite est si élevé, la méthode d'ovulation ne

(Continued on page 28)

Family Planning Among Low-Income Women In Rio de Janeiro: 1984–1985

> **"It appears that sterilization has changed from being a method of last resort for women who have exceeded their desired family size to being a preferred means of fertility control among women of relatively low parity."**

By Sarah Hawker Costa, Ignez Ramos Martin,
Sylvia Regina da Silva Freitas and Cristiane Schuch Pinto

Summary

A 1984–1985 survey in seven slum communities of Rio de Janeiro found that seven percent of sexually active women aged 15–49 were pregnant, 20 percent had been contraceptively sterilized and five percent were infertile. The remaining 68 percent were fecund: Some 42 percent were using a reversible method of birth control, and 27 percent were not pregnant or trying to become pregnant and were not using any contraceptive method. The pill and female sterilization were the two leading birth control methods among currently married women practicing contraception, used by 53 percent and 33 percent, respectively.

The relatively high levels of sterilization and pill use among low-income women found in the survey are striking. However, knowledge of and access to other methods are limited, and consequently, some women were found to be using inappropriate methods. For example, 15 percent of sterilized women said they wanted to have another child. In addition, the survey found that 43 percent of current pill users also smoked, and five percent were both older than 45 and cigarette smokers. Fifty percent of the pill users reported that they suffered from such contraindications to pill use as high blood pressure, heart problems, diabetes, kidney disorders or varicose veins. Only 42 percent had seen a doctor before using oral contraceptives, which are available without a prescription.

Background

Brazil is the largest and most populous country in Latin America, with a population that is projected to reach about 170 million by the year 2000.[1] Census and registration statistics have shown that fertility has been declining in Brazil since the middle of the 1960s; the total fertility rate dropped from 6.2 children per woman in 1960 to 3.5 in 1986.[2] The largest declines between 1980 and 1984 occurred in the Central East region (a 25 percent drop) and in the Northeast (20 percent). Because poorer women make up the major part of the population of these two regions, the data suggest that they are reducing their childbearing substantially.[3] In addition, a number of surveys have demonstrated increases in contraceptive practice among Brazilian women.[4] These changes have occurred in the absence of an effective government-sponsored family planning program, although since 1983, the Ministry of Health has made contraceptive services available as part of its Comprehensive Health Care Program for Women, and the Ministry of Social Security (Instituto Nacional de Assistência Médica e Previdência Social—INAMPS) began a similar program in 1985.

The survey described in this article was designed to measure patterns of contraceptive practice in seven slum communities (*favelas*) of Rio de Janeiro in late 1984 and early 1985. The results will be compared with data gathered in the 1986 Brazilian Demographic and Health Survey (DHS) for the urban area of Rio de Janeiro. The favela survey was undertaken as preparation for offering family planning services out of the community health center that is attached to the National School of Public Health in Rio de Janeiro. The health center (Sinval Germano Filho) began offering contraceptive information to residents of these favelas in 1985 and added services in 1987, providing the pill, the IUD and the diaphragm to women of all ages, regardless of marital status. However, at the time of the survey, women living in the communities around the health center obtained their methods mainly from drugstores (if they were using the pill or condoms) and through government-reimbursed public hospitals or private clinics (if they were seeking sterilization). A small minority obtained services from private family planning clinics run by the Sociedade Civil Bem-Estar Familiar no Brasil and by the Centro de Pesquisas de Assistência Integrada à Mulher e à Criança (CPAIMC), which provides maternal and child health and family planning services.

The Survey Sample

On the basis of a two-stage stratified random sampling procedure, respondents were selected from among all women aged 15–49 living in the catchment area of the Sinval Germano Filho health center. This area of Rio de Janeiro covers seven slum neighborhoods* of varying ages. The oldest was established for returning veterans after World War II; the newest was established in 1955. The communities are located in the northern zone of the city and contain heavy industries, including an oil refinery, which makes this one of the most polluted areas in Rio. Rapid growth has led to considerable overcrowding and to a deterioration in the already poor living conditions. Dwellings are tightly packed together, and access is often possible only through a network of narrow alleys and passages. As space has become more and more scarce, homes have gone up along the banks of the river that cuts across the region, and in some cases, they have been built on stilts projected above the water.

Over 90 percent of households have elec-

Sarah Hawker Costa is associate professor in the Department of Epidemiology and Quantitative Methods, Ignez Ramos Martin is assistant professor in the Department of Planning and Administration, and Sylvia Regina da Silva Freitas and Cristiane Schuch Pinto are public health researchers, all at the Fundação Oswaldo Cruz of the Escola Nacional de Saúde Pública, Rio de Janeiro. The authors are grateful to the Special Programme of Research, Development and Research in Human Reproduction of the World Health Organization, and especially to Axel Mundigo, for providing the financial support for the survey on which this article is based.

*Amorim, Carlos Chagas, Ex. Combatentes, João Goulart, Perereca, Vila Turismo and Vila União.

tricity, although many obtain it through illegal (and dangerous) connections. Only a few households have running water—the majority depend on public taps for their supply. Raw sewage flowing along open canals creates serious health problems, particularly after heavy rains. Seven out of 10 houses in the communities have three or fewer rooms (four out of 10 have two or fewer), and six out of 10 have cement floors. The area is well served by public transportation services, and there are several primary schools and two large hospitals within the area. Municipal and state primary health care services are available, but are often of poor quality and inadequate to the needs of the population.

The age structures and socioeconomic profiles of the seven slum communities tend to differ somewhat, the residents being generally older and slightly more prosperous in the more settled communities than in the more recently established ones. The sample size needed to estimate contraceptive prevalence was stratified for slum area, with sample fractions varying according to stratum. Data presented in this article are based on a pooled sample, since no significant difference in contraceptive practice was detected among the slum communities.

Most of the women living in the favelas are migrants from other parts of the country, particularly the underdeveloped North and Northeast regions. The average number of live births among respondents aged 40–44 (who are likely to have completed childbearing) was 3.8. Among married women in this age-group, it was 3.9.

Table 1 compares the characteristics of the 1,783 women finally interviewed with those of women who made up the urban Rio de Janeiro portion of the sample for the DHS carried out in Brazil in 1986. The latter included only women up to the age of 44, whereas the current sample includes women up to the age of 49. If the favela sample is redistributed into a 15–44 age range, it becomes apparent that the women in it are slightly younger than those participating in the DHS. As the table indicates, female educational levels are very low in these communities: Seventy-four percent of the favela women (as compared with 62 percent in the DHS sample[5]) have not completed primary school or are illiterate. Only eight percent have at least completed secondary school.

As regards family income, the numbers are somewhat deceptive. The poverty standard in Brazil is usually measured in terms of households with less than half the minimum salary per capita. Since the average household among respondents contained five members, all families with less than 2.5 times the minimum salary as a combined income—over half of the sample—must be considered to have been living in poverty. Because the DHS sample covers the whole city, including its middle-class sections, the women in it are, on average, more affluent than the slum women.[*] The DHS urban sample for Rio is, therefore, somewhat older, better educated and less poor than that in the favela survey.

In addition, the favela survey defined marital status somewhat differently from most surveys in order to create a more representative group of women at risk of pregnancy. As is customary, women were asked if they were married (consensually or legally); single; or widowed, divorced or separated. However, single women and formerly married women were also asked if they had a steady but not cohabiting relationship with a man. If so, these women were grouped among those in a union. The proportion in union in the favela survey was six percentage points greater than in the DHS (65 percent as compared with 59 percent), while the category of women widowed, divorced and separated was four points less, and the proportion single, two percentage points less.

Sexual Activity and Contraceptive Use

All ever-married women, whatever their current status, were assumed to be sexually active. Among the never-married (30 percent of the total), 27 percent reported having had sexual intercourse at some time. This proportion varied, of course, by the woman's age: among single women 15–19, 11 percent had had sexual intercourse; among those 20–24, 26 percent had done so; and among the older groups, over one-half had done so. The level of teenage sexual activity among the unmarried is slightly higher than the six percent found nationally in the 1986 DHS.[6] Measures in both surveys are likely to be underreported, given the social and moral taboos against premarital sex in Brazil. In the favela survey, older family members were often present when the teenagers were interviewed, making it more likely that sexual activity would be underreported among this age-group.

Table 1. Percentage distributions of the 1984–1985 favela survey sample and the 1986 Demographic and Health Survey urban Rio de Janeiro sample, by various characteristics

Characteristic	Favela survey (N=1,783)	DHS (N=617)
Age-group		
15–19	17.3	17.4
20–24	18.8	19.1
25–29	18.7	19.8
30–34	16.4	18.5
35–39	11.3	12.9
40–44	9.2	12.3
45–49	8.3	na
Educational level		
Illiterate	12.6	12.3
Some primary	61.5	49.8
Primary, some secondary	17.7	29.9
Secondary or more	8.2	8.0
Family income (in multiples of the minimum salary)		
Unknown or no income	5.2	u
<1	6.0	u
1–2.99	55.2	u
3–4.99	21.6	u
≥5	12.0	u
Marital status		
In union[*]	65.2	59.2
Single	30.2	32.2
Widowed, divorced, separated	4.6	8.6
Work status		
Works outside home	32.8	u
Works at home	15.1	u
Does not work	52.1	u
Total	100.0	100.0

[*] In this and subsequent tables, refers to legal and consensual unions.

Notes: In this and subsequent tables, na=not applicable; u=unavailable.

Source: For DHS data in this and subsequent tables, special tabulations.

The fecundity status of the women who had had sexual intercourse (the vast majority of whom were currently in union) is shown in Table 2 (page 18). This analysis reveals that seven percent of women were pregnant at the time of the survey (exactly the same as in the DHS sample for urban Rio de Janeiro[7]), 20 percent had been contraceptively sterilized (as compared with 29 percent according to the 1986 DHS[8]) and five percent were infertile. The 68 percent of the total who remained fecund consisted of 42 percent who were using a reversible method of birth control (39 percent in the DHS[9]) and 27 percent who were not practicing any kind of fertility regulation (22 percent in the DHS sample[10]). The higher level of contraceptive sterilization

---

[*] The DHS sample is based on the sample used for Brazil's yearly household survey, the Pesquisa Nacional por Amostra de Domicílios (PNAD). The PNAD of 1986 shows that only about 15 percent of households in the urban Southeast region have family incomes of 1–3 times the minimum salary, compared with 55 percent in the favela survey. (See: Fundação Instituto Brasileiro de Geografía e Estatística, *Perfil Estatístico de Crianças e Mães no Brasil*, UNICEF, Rio de Janeiro, 1988, Table 2.)

Table 2. Percentage distribution of low-income women in Rio de Janeiro who have ever had sexual intercourse, by fecundity status, according to age-group

Fecundity status	Total (N=1,359)	15–19 (N=88)	20–24 (N=230)	25–29 (N=304)	30–34 (N=270)	35–39 (N=197)	40–44 (N=165)	45–49 (N=145)
Pregnant	6.5	20.5	10.9	7.2	5.2	4.1	1.9	0.7
Using a reversible method	41.7	45.4	60.9	54.6	40.7	31.9	23.0	17.2
Using no method	26.7	34.1	25.6	21.7	21.9	27.0	35.3	33.8
Contraceptively sterilized	19.8	0.0	2.6	16.1	31.9	33.5	28.6	15.9
Menopausal or had a hysterectomy	5.3	0.0	0.0	0.3	0.3	3.5	11.2	32.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

and the lower level of nonuse found in the DHS sample for urban Rio can probably be explained by the older age, higher educational level and greater affluence of that sample rather than by any change in contraceptive practice in the period between the two studies. The survey findings reported here also differ greatly from the DHS findings in one other respect—levels of current pregnancy among teenagers and women aged 20–24. The proportion of 15–19-year-olds who were pregnant is double the level found in the DHS (21 percent compared with 10 percent) whereas the proportion of women aged 20–24 who were pregnant is roughly half the level found in the DHS (11 percent compared with 19 percent).[11]

As might be expected, levels of natural infecundity and sterilization were higher among the older than among the younger women. For example, 40 percent of women 40–44 were incapable of conceiving for either of these reasons. The level of contraceptive nonuse also varied widely with the woman's age, going from 22 percent among those aged 25–34 to 34–35 percent among teenagers and women 40–44. Some of these women, especially in the younger age-groups, were trying to become pregnant, and some, especially in the older age-groups, were likely to have thought they were no longer capable of conceiving. Overall, approximately two percent said they were seeking pregnancy, and one percent said they had had unprotected intercourse for at least three years without becoming pregnant (not shown). Other women were likely to be amenorrheic or breastfeeding after a recent pregnancy, and consideration of these factors would reduce still further the proportion of women truly at risk of pregnancy. Nevertheless, the measures presented here indicate that approximately one-fourth of all the sexually experienced women surveyed were fecund, not pregnant or trying to become pregnant and not using any contraceptive method to avoid pregnancy.

Table 3. Percentage of women using any contraceptive method (including female sterilization), and percentage contraceptively sterilized, by age-group and marital status, favela survey and DHS

Characteristic	Using any method		Contraceptively sterilized	
	Favela survey (N= 1,783)	DHS (N= 617)	Favela survey (N= 1,783)	DHS (N= 617)
All women	**48.6**	**50.6**	**15.8**	**21.6**
Age-group				
15–19	12.9	10.5	0.0	0.0
20–24	43.9	33.8	1.8	3.7
25–29	64.4	61.7	14.7	18.4
30–34	67.2	70.5	29.4	37.1
35–39	64.0	67.4	32.7	43.5
40–44	51.8	68.2	29.2	38.6
45–49	36.0	na	18.3	na
Marital status				
In union	66.8	71.8	21.9	33.7
Single	35.1	10.1	4.0	0.5
Widowed, divorced, separated	44.4	42.0	25.9	18.0

All respondents were asked to list the ways they knew of regulating their fertility. If a woman did not mention a method spontaneously, the interviewer described it and then asked her if she was familiar with it. As Figure 1 shows, the level of spontaneous knowledge about any method other than the pill (mentioned spontaneously by a remarkably high 92 percent) is quite low. Forty-two percent mentioned the IUD; 35 percent, the rhythm method; and 25 percent, female sterilization. Spontaneous knowledge of other methods did not exceed 18 percent. After prompting, however, levels of knowledge jumped to 91 percent for female sterilization, 84–87 percent for the IUD, rhythm and the condom, and around 50 percent for injectables, spermicides and withdrawal. Levels of both spontaneous and prompted knowledge are lowest among teenage women and those over the age of 39 (not shown).

It is difficult to interpret the real meaning of these wide differences between spontaneous and prompted knowledge. One interpretation, however, is that women who need contraceptive protection tend to mention spontaneously the one method that is readily available in pharmacies—the pill—rather than those methods that are difficult to seek out. The difference between spontaneous knowledge of female sterilization and prompted knowledge may reflect the women's perceptions of this method. Many women may consider sterilization to be less of a method for avoiding pregnancy and more of one for terminating childbearing.

Table 3 shows levels of contraceptive use (including reliance on sterilization) and the proportion sterilized among all women, regardless of their fecundity status. Again, findings from the urban Rio de Janeiro sample of the DHS are shown for the sake of comparison. Contraceptive prevalence varies greatly with the woman's marital status and age. The highest overall prevalence level is to be found among women aged 30–34 and women currently in union (67 percent—similar to the level of 71–72 percent found in the 1986 DHS[12]); the lowest, among women aged 15–19 (13 percent), those aged 45–49 (36 percent) and single women (35 percent). These low rates may indicate that a good number of teenagers and most single women are not involved in a sexual relationship, and, as we have just shown, many older women are no longer fecund. Some 16 percent of women 15–49 had been contraceptively sterilized; the proportion ranges from only two percent of those aged 20–24 to 33 percent of those aged 35–39. In terms of marital status, the highest proportion sterilized is found among formerly married women, probably because these women are older, on average, than currently married women. The somewhat higher DHS rates for all methods and for sterilization, again, probably reflect the slightly higher status of that sample.

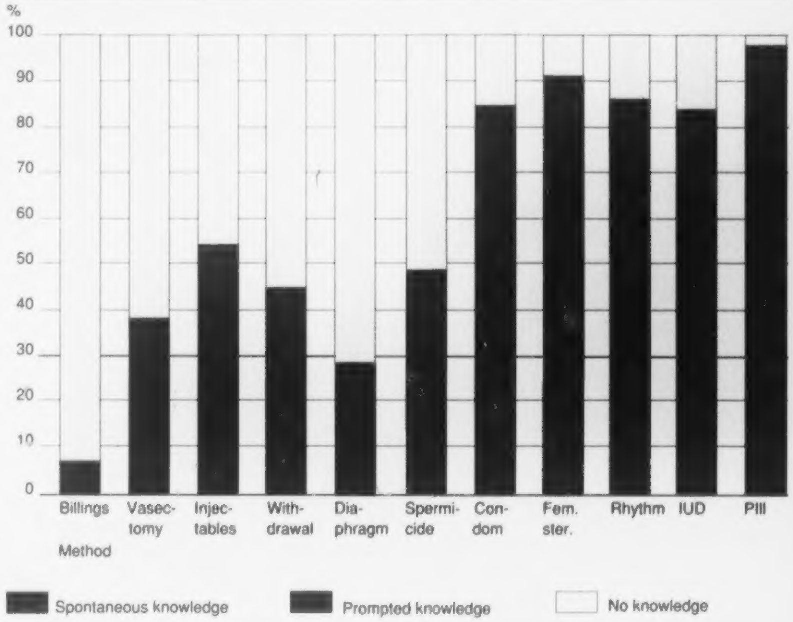
We have seen that the greatest level of contraceptive use is found among married women. What kinds of contraceptive methods are they using? By far the predominant method among favela women, as Table 4 (page 20) shows, is the pill (which accounts for 53 percent of all contraceptive practice among married women 15–49); female sterilization follows (33 percent). Only 14 percent of use is attributable to any other method, mainly rhythm (four percent) and the IUD, condoms, spermicides and withdrawal (each about two percent). The type of contraceptive used is strongly related to the user's age. Among married teenage users, the pill is the choice of almost nine out of 10; the remainder rely on the rhythm method or have their partners use condoms. Among married women 20–24 using a method, eight out of 10 rely on oral contraceptives, whereas among those 40–44, only three out of 10 do so; in the latter age-group, over half have been sterilized. The pill assumes less importance among married users over the age of 44, and reliance on other reversible methods (especially rhythm) is at its highest level in this group.

The pattern of contraceptive use varies much less by education or family income than it does by the woman's age. The best-educated married users are somewhat less likely than average to be contraceptively sterilized, and the most affluent are somewhat more likely than average to be using a reversible method other than the pill. However, if all married women, rather than all users, are taken into consideration, the 1986 DHS shows that better-educated women are *more* likely than those with less schooling to opt for sterilization as a means of fertility regulation.[13] This finding is supported by contraceptive prevalence patterns observed among the slightly older, better-educated and wealthier DHS sample. For every age-group and educational level, pill use among this sample is lower and reliance on sterilization is higher than among the women in the favela survey. The differences are particularly marked among older women, possibly because they have easier financial access to sterilization services provided by private doctors than do their poorer counterparts.

It is instructive to compare the patterns of contraceptive use found in urban Brazil with those in neighboring Colombia. If 1986 DHS data for urban Rio de Janeiro are compared, for example, with those for the same year in Bogotá or even in all urban areas of Colombia (using the DHS data for that country), the proportions of married women using various methods are as follows:

Method	Urban Rio	Bogotá	Urban Colombia
Pill	36	18	26
Fem. ster.	47	22	27
Other	17	60	47
Total	100	100	100

Figure 1. Percentage distribution of all women by type of knowledge about various contraceptive methods



In Bogotá, married women clearly use a far wider choice of reversible methods other than the pill than do women from urban Rio de Janeiro, and there is considerably less reliance on female sterilization.[14] There is no official national family planning program in Colombia, and pills are available in drugstores, as they are in Brazil. The private family planning association, Profamilia, serves 39 percent of all Colombian women using a supply method of birth control; 33 percent obtain their method from pharmacies, and 15 percent from Ministry of Health hospitals and health centers.[15] Profamilia's urban clinics provide the full range of contraceptive methods at low cost to all women seeking such care.[16]

Interviewers closely questioned women to find out if they might have some contraindications to pill use, since this was such a widely used method and is available in Brazil without a doctor's prescription. The findings are worrisome, revealing that 43 percent of current pill users also smoked. Thirty-two percent of women in this group smoked over 10 cigarettes a day, and 10 percent smoked over 20 a day. In addition, five percent of all pill users were both over the age of 45 and cigarette smokers.

All women were also asked whether they suffered from high blood pressure, heart problems, diabetes, kidney disorders or varicose veins (all contraindications to pill use). Although there was no attempt to verify the responses clinically, the anecdotal reports are disturbing. Fifty percent of both pill users and all other women said that they suffered from at least one of these health problems. Among women over the age of 34, 68 percent of pill users and 74 percent of all others had at least one of these conditions.

A total of 466 women were using the pill at the time of the survey. Only 42 percent had seen a doctor before starting use, even though 64 percent had consulted a doctor in the year before the survey. Only one-third were using a low-dose combination. More than eight out of 10 pill users said that they had experienced some kind of unwelcome side effect (mostly "nervousness," headaches, weight gain, menstrual disturbances and nausea), but 65 percent of these had not consulted a doctor to report their symptoms. The main reason given for not doing so was that it was unnecessary; lack of time and a dislike of going to the doctor were the next most common responses. Of those who did see a doctor, one-fifth continued to use the pill against the doctor's advice, mostly out of a fear of pregnancy or because this was the only method they trusted. Reports of side effects are difficult to analyze, since they may be influenced by cultural, biological

Table 4. Percentage distribution of currently married women practicing contraception, by method used, according to various characteristics, favela survey and DHS

Characteristic	Favela survey				DHS			
	Pill	Fem. ster.	Other	Total	Pill	Fem. ster.	Other	Total
All women	**53.3**	**32.8**	**13.9**	**100.0**	**35.9**	**46.6**	**17.5**	**100.0**
Age-group								
15–19	88.5	0.0	11.5	100.0	87.5	0.0	12.5	100.0
20–24	80.1	4.6	15.3	100.0	71.0	12.9	16.1	100.0
25–29	65.8	23.8	10.4	100.0	48.1	35.2	16.7	100.0
30–34	46.4	43.2	10.4	100.0	28.2	56.3	15.5	100.0
35–39	36.4	48.8	14.8	100.0	15.9	68.2	15.9	100.0
40–44	28.8	54.8	16.4	100.0	16.3	55.8	27.9	100.0
45–49	18.0	50.0	32.0	100.0	na	na	na	100.0
Educational level*								
Illiterate	45.6	33.3	21.1	100.0	40.0	53.3	6.7	100.0
Some primary	53.7	34.9	11.4	100.0	38.7	48.0	13.3	100.0
Primary or more	57.4	25.9	16.8	100.0	28.2	40.8	31.0	100.0
Family income (in multiples of the minimum salary)								
<1	54.0	30.1	15.9	100.0	u	u	u	100.0
1–2.99	54.9	32.7	12.4	100.0	u	u	u	100.0
3–4.99	52.4	33.3	14.3	100.0	u	u	u	100.0
≥5	47.6	35.4	17.0	100.0	u	u	u	100.0

*For the DHS breakdown, the three educational categories are illiterate, complete primary and secondary schooling or more.

or individual factors. In addition, the symptoms may not be attributable to the use of oral contraceptives.

Women were also closely questioned as to the way in which they used the pill. Twenty-three percent (and 36 percent of users aged 35–39) were taking it incorrectly—on alternate days or only prior to or after sexual intercourse, for example. Most of these women knew the right way but chose not to follow instructions for a variety of reasons, such as to avoid disagreeable side effects or to reduce the overall cost of supplies.

Related Issues

One in every six women interviewed were under the age of 20. This is the only age-group of women in Brazil to demonstrate a virtually unchanged fertility rate in the last decade, while the rate declined rapidly among the remaining age-groups.[17] (The age-specific fertility rate for women 15–19 increased from 74.8 births per 1,000 in 1970 to 79.8 in 1980, and then decreased to 74.0 per 1,000 in 1984.[18])

Only 24 percent of teenage women said they had ever had sexual intercourse; this group was made up of 19 percent who were married and five percent who were single (11 percent of all single adolescents). The average age of women in this group is likely to be between 17 and 18; if we wish to examine the completed experience of teenagers, we can look at the reproductive lives of women currently 20–24 while they were teenagers (that is, before reaching their 20th birthday). Figure 2 indicates that at age 15, some 20 percent had already become sexually active, and six percent had entered union. At age 17, these proportions rose to 31 percent and 20 percent, respectively. By age 19, 52 percent of women had had intercourse, and 39 percent had married (legally or consensually). These proportions are very similar to those found among all women 20–24 in the 1986 DHS—50 percent had had sex, and 39 percent had married for the first time before their 20th birthday.[19] Ever-use of a contraceptive ranges from 18 percent at age 17 to 39 percent at age 19. A probable explanation for these low levels is that most sexually active teenagers are in a union and trying to become pregnant, or at least not trying to postpone pregnancy.

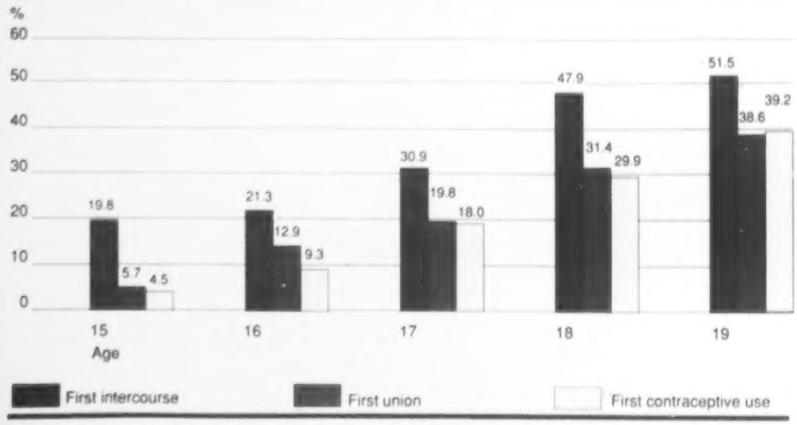


Figure 2. Percentage of women aged 20–24 who had had intercourse, entered a union or used a contraceptive method before the age of 20, by age at which the event first occurred

Over the past two decades, female sterilization has become one of the most widely used methods of fertility regulation in Latin America,[20] a trend that has greatly surprised health professionals in the region, who had believed that women in this part of the world would be resistant to this method.[21] In 1986, the DHS found that female sterilization was the leading method of birth control used by married Brazilian women aged 15–44 (27 percent), followed closely by the pill (25 percent).[22]

Among all women aged 15–49 living in the slums of Rio de Janeiro, 16 percent have been contraceptively sterilized. Ninety percent of these women are currently in union; eight percent are widowed, divorced or separated; and two percent are single. Some other characteristics of these women are shown in Table 5, which indicates that 48 percent of sterilized women underwent the operation before the age of 30, and 73 percent before the age of 35. Thirty-one percent had had fewer than three live births, and 22 percent had had more than four by the time they chose to terminate childbearing. INAMPS hospitals and private doctors contracted by INAMPS were the major providers of sterilization for these women. Through these providers, the procedure should be free of cost to the woman; however, 70 percent of respondents who used these services reported that a payment was necessary to obtain the operation. Only 27 percent of sterilized women had gone to a private

Table 5. Percentage distribution of low-income women who have been contraceptively sterilized, by various characteristics

Characteristic	% (N=282)
Age at sterilization	
≤24	12.1
25–29	35.8
30–34	25.5
≥35	26.6
No. of live births	
1	2.8
2	28.2
3	27.0
4	19.9
5	6.8
≥6	15.3
Place of sterilization	
INAMPS facility	9.9
Private physician contracted by INAMPS	49.6
Federal, state or municipal health service	13.5
CPAIMC	11.7
Private service or physician	9.9
Other and unknown	5.3
Timing of operation	
Postcesarean	62.8
After vaginal delivery	3.5
Interval procedure	28.4
Unknown	5.3
Previous reversible methods used*	
Pill	81.2
Condom	22.0
IUD	5.8
Rhythm	17.7
Withdrawal	14.4
Other	16.2
None	3.2
Reason for sterilization	
Wanted no more children	60.6
Health problems	24.1
Unable to use pill	6.4
Financial situation	3.5
Other	5.4
Total	100.0

*Percentages add to more than 100 because women may have used more than one method.

clinic or other location, and 78 percent of them reported having paid for services.

Sixty-three percent of all sterilized women had the operation after a cesarean delivery. (The national level from the 1986 DHS is 64 percent.[23]) Other data (not shown) indicate that an even higher proportion—three-quarters—of all procedures performed by private doctors under contract to INAMPS were postcesarean operations. Because a previous cesarean section is considered an indication for sterilization under the terms of the Brazilian Medical Ethics Code, it has been reported that abnormally high proportions of Brazilian women are being delivered by this method in order to become administratively eligible for sterilization.[24]

All but three percent of sterilized women said they had used some reversible contraceptive method before having the operation. As might be expected, by far the largest proportion had used the pill. Finally, 61 percent of sterilized women said they wanted the procedure to avoid having any more children, 24 percent gave health problems as a reason, and six percent mentioned inability to take the pill. The reasons for becoming sterilized appear to have changed in recent years. Among women who were sterilized 10 or more years before the survey, the same proportion (44 percent) said it was for fertility regulation and for health reasons, whereas among those sterilized less than two years before, 68 percent cited the need for fertility regulation and only 19 percent mentioned health problems.

One disturbing finding is that 15 percent of sterilized women said they wanted to have another child in the future, and 11 percent believed themselves capable of doing so. This finding suggests that some women changed their mind about childbearing after becoming sterilized, had a poor understanding of the implications of their decision to be sterilized, or were poorly counseled before the operation.

Data were collected on women's lifetime history of spontaneous and induced abortions. (Access to legal abortion is highly restricted in Brazil—permitted only to save the woman's life or in cases of rape—and so the total number of abortions reported is probably an undercount.) In all, 32 percent of women had experienced at least one miscarriage or induced abortion, and 17 percent reported they had had an induced abortion. Among women who had ever had an induced abortion, the average number they had had was 2.1. When asked why they had had an induced abortion, 29 percent of women cited economic reasons, 20 percent said they had not wanted a child at that time, a further 16 percent said they had not wanted any more children ever, 11 percent cited marital instability, nine percent said they had not been married and the remainder mentioned health or other problems.

Table 6. Percentage distribution of low-income women who have ever had an induced abortion, by various characteristics

Characteristic	% (N=305)
Gestation (in mos.)	
1	22.9
2–3	63.3
4–6	8.9
Unknown	4.9
Age at interview	
≤19	3.9
20–29	29.5
30–39	35.4
≥40	31.1
Method used before unwanted pregnancy	
Pill	21.3
Traditional method	5.6
Other	6.9
None	62.3
Unknown	3.9
Practitioner	
Physician	65.5
Traditional midwife	9.8
Self-induced	18.0
Other and unknown	6.6
Location	
Hospital	6.9
Clinic	58.0
Traditional midwife's home	8.2
Woman's home	22.0
Other	4.9
Type of procedure	
Instrumental evacuation	62.1
Medication	13.3
Catheter insertion	11.0
Other	9.6
Unknown	4.0
Complication	
Yes	22.3
No	73.8
Unknown	3.9
Total	100.0

Table 6 summarizes the most recent experience of the 305 women who reported having had an induced abortion. Two-thirds of the women who had had an induced abortion were in their 30s and 40s at the time of the interview. More than six out of 10 women said they had not been using any contraceptive method when they became pregnant. Two out of three abortions were performed by doctors, and six out of 10 were carried out by instrumental evacuation. If a traditional midwife performed the operation, she most commonly would insert a catheter into the uterus to induce the abortion. A small proportion of the procedures involved such potentially dangerous techniques as the insertion of twigs or knitting needles. One in five women experienced complications, and of these cases, one in seven required hospitalization (not shown). The technique most strongly related to the likelihood of complication was the insertion of a catheter.

Conclusions

The findings from the 1984–1985 survey show relatively high levels of contraceptive use among the residents of seven slum communities in Rio de Janeiro; nearly one-half of all respondents and three-quarters of those at risk of pregnancy were practicing family planning. What is more, the leading methods used were generally the most highly effective—the pill and female sterilization. This is an impressive finding, given that Brazil had no national family planning program at the time of the survey. However, it is notable that women in the favelas were using very few methods other than the pill and sterilization to regulate their childbearing, probably because access to other methods was limited.

Because both the pill and sterilization are unrelated to coitus and their correct use is not dependent on a woman's knowledge of her body or cooperation from her partner, these methods are probably more attractive than others to women in Brazil who do not have doctors or family planning counselors with whom to discuss contraceptive matters, or to women who are unused to discussing birth control with their husbands or boyfriends.

The high level of sterilization found among women living in the favelas of Rio (as among all women in Brazil) is striking. One-third of all contraceptive use among married women was accounted for by sterilization, as was one-half of use among all women older than 34. Nearly one-half of sterilized women had had the operation before they were 30, and most of the procedures had been performed subsequent to a cesarean delivery. Almost one-third of sterilized women had had fewer than three live births. It appears, therefore, that sterilization has changed from being a method of last resort for women who have exceeded their desired family size to being a preferred means of fertility control among women of relatively low parity.

This trend would not be problematic if young women had ample access to reversible methods other than the pill and a clear understanding of the implications of becoming sterilized. It is difficult to assess from the present findings how much of the high demand for sterilization arises from the perceived inadequacies of available reversible methods (mostly the pill and the condom) and how much is generated by the medical services available to poor women. More troubling still is the finding that over one-half of women using the pill reported medical conditions that are usually contraindications to pill use. In addition, a certain proportion of women who chose the pill use the method incorrectly.

The highest level of nonuse among women exposed to the risk of pregnancy was among those over the age of 40. Most of these women were poor candidates for the pill (because of health problems or because they smoked), yet very few appeared to know of suitable alternatives other than sterilization. In addition, one-third of teenagers at risk of pregnancy were not practicing birth control. In the absence of specialized family planning services for younger and older urban women, teenagers are unlikely to come into contact with health professionals until they become pregnant for the first time, and older women may not be reached until they have suffered a serious health problem, such as a complicated delivery or experienced an unwanted pregnancy.

The study underlines the need for a family planning program that offers the full range of modern methods and at the same time provides information about each method and its use, side effects, effectiveness and contraindications to enable low-income women to make a more informed choice. Consequently, the program that began at Sinval Germano Filho in 1987 places great emphasis on educational activities. Every woman attending the center participates in two information sessions before being referred to a doctor, at which time her choice is fully discussed and the most suitable method prescribed. Discussion groups aimed at attracting specific target populations, such as adolescents, have been formed and these cover a broad range of topics, especially reproductive health. During these sessions, teenagers identified as in need of family planning care are encouraged to use the program. Older women using the health center are also informed about the program, and their participation is further encouraged by the community health workers.

To date, over 400 women are registered in the program. The most widely used method among participants is the pill (31 percent of all use), although significant proportions are using the IUD and the diaphragm (39 percent). Nonetheless, demand greatly exceeds the service capability. Thus, in order to maintain the high standards of quality the program offers, only women residing within the catchment area are eligible to use the center, and even for these women, the average waiting time for the first interview is about one month.

References

1. A. A. Camarano, K. Beltrão and R. Neupert, *Século XXI: A Quantas Andará a População Brasileira?* Instituto de Planejamento Economico e Social and Instituto de Planejamento, Brasília, Feb. 1989.

2. C. C. S. Simões and L. A. P. Oliveira, *Perfil Estatístico de Crianças e Mães no Brasil—A Situação da Fecundidade: Determinantes Gerais e Características da Transição Recente,* Instituto Brasileiro de Geografía e Estatística, Rio de Janeiro, 1988; and Sociedade Civil Bem-Estar Familiar no Brasil (BEMFAM) and Instituto para Desenvolvimento de Recursos, *Pesquisa Nacional Sobre Saúde Materno-Infantil e Planejamento Familiar*, Rio de Janeiro, 1987, p. 26.

3. L. R. Wong and J. C. Oliveira, "Niveis e Diferéncias de Fecundidade para o Brasil Segundo, Dados do Censo de 1980 e do PNAD de 1984," paper presented at the Fourth National Conference of the Asociação Brasileira de Estudos Populacionais, Aguas de São Pedro, São Paulo, 1985.

4. BEMFAM, *Pesquisa Sobre Saúde Materno-Infantil e Planejamento Familiar*—São Paulo 1978; Piauí 1979 and 1982; Rio Grande do Norte 1980; Bahía 1980; Região Sul 1981; Amazonas 1982; and ——, 1987, op. cit. (see reference 2).

5. Special tabulations from the tape of the 1986 Demographic and Health Survey (DHS) in Brazil.

6. M. H. Henriques et al., *Adolescentes de Hoje, Pais do Amanhã,* The Alan Guttmacher Institute, New York, 1989.

7. Special tabulations from the tape of the 1986 DHS in Brazil.

8. Ibid.

9. Ibid.

10. Ibid.

11. Ibid.

12. Ibid.

13. BEMFAM, 1987, op. cit. (see reference 2), Table 4.6.

14. Corporación Centro Regional de Población, Ministerio de Salud de Colombia, and Demographic and Health Surveys, Institute for Resource Development/Westinghouse, *Encuesta Nacional de Prevalencia del Uso de Anticonceptivos y Primera de Demografía y Salud, 1986,* Bogotá, 1988, Table 4.6.

15. Ibid., Table 4.11.

16. G. Ojeda, "Informe de Actividades de Servicio 1988," *Boletín de Evaluación y Estadística,* No. 52, Profamilia, Bogotá, 1989.

17. L. R. Wong and J. C. Oliveira, 1985, op. cit. (see reference 3).

18. C. C. S. Simões and L. A. P. Oliveira, 1988, op. cit. (see reference 2).

19. M. H. Henriques et al., 1989, op. cit. (see reference 6), Figure 5.7.

20. J. A. Ross, D. H. Huber and S. Hong, *Voluntary Sterilization: An International Fact Book,* Association for Voluntary Sterilization, New York, 1985.

21. J. M. Stycos, "Sterilization in Latin America: Its Past and Future," *International Family Planning Perspectives,* 10:58, 1984.

22. BEMFAM, 1987, op. cit. (see reference 2), Table 4.6.

23. Ibid., Table 6.2.

24. Ibid.

Resumen

Según una encuesta realizada entre 1984 y 1985 en los barrios bajos de Río de Janeiro, de las mujeres de 15 a 49 años sexualmente activas un siete por ciento estaban embarazadas, un cinco por ciento eran infecundas y un 20 por ciento se habían hecho esterilizar. El 68 por ciento restante eran fecundas, con 42 por ciento empleando un método anticonceptivo reversible, y 27 por ciento no estando embarazadas ni queriando serlo, y no usando ningún método. Entre las actualmente casadas que practicaban la anticoncepción, la píldora y la esterilización femenina eran los métodos más difundidos (53 por ciento y 33 por ciento, respectivamente).

(Continued on page 28)

Who Forgets to Take the Pill? The Thai Experience

Doubts about the suitability of oral contraceptives for the rural and poorly educated masses receive little support from the experience of Thai women: Rural women report forgetting to take the pill less frequently than their urban counterparts.

By Siriwan Siriboon, Chanpen Saengtienchai and John Knodel

Summary

Rural women with modest or no education are capable of using oral contraceptives correctly and may even do so more often than educated urban women, according to the reports of 1,170 current pill users in the Thai Demographic and Health Survey who were asked whether they had forgotten to take a pill in the last month, and, if so, how many pills they had forgotten. Bivariate and multivariate analyses of pill use and background characteristics revealed that rural women, especially those working in agriculture, are less likely to forget to take a pill than are their urban counterparts. Poorly educated women are also less likely to forget to take a pill than are women with at least a secondary education, although they are more likely to forget to take three or more pills within a cycle when they do forget. Correct pill use is associated with older age, longer duration of method use and desire for no more children. Women who purchase pills from drugstores or from government sources are also more likely to forget to take them than are women who obtain them free from government outlets.

Introduction

Contraceptive prevalence has risen rapidly and fertility has fallen substantially in many, although by no means all, areas of the developing world. One specific concern about the use of family planning in these countries, however, has not been adequately explored: the ability of predominantly illiterate or poorly educated persons to practice methods that require repeated or daily actions, such as the oral contraceptive pill. To date, relatively little systematic research is available on this subject. However, evidence on the extent to which contraceptive pill users remember to take their daily dose has been recently collected in Thailand, a country in which oral contraceptives have been widely used during the last decade.

Data from the Thai Demographic and Health Survey (TDHS), conducted in 1987 by the Institute of Population Studies, Chulalongkorn University,[1] indicate that overall contraceptive prevalence in Thailand is 68 percent among currently married women aged 15–44, one of the highest levels recorded for a developing country.[2] Thirty-one percent of these users, or 20 percent of all currently married women aged 15–44, rely on oral contraceptives. The prevalence of pill use has remained relatively constant for approximately a decade, after rising sharply from four percent at the start of the 1970s. During much of this time, the pill was the most prevalent method, being overtaken only recently by female sterilization, which is now used by 22 percent of currently married women. The pill remains the most common method of ever-use, with more than half (55 percent) of ever-married women aged 15–49 in the TDHS sample reporting having used it at some time.

This article is based on responses to two special questions added to the TDHS: All current users were asked whether they had forgotten to take a pill during the last month, and, if so, how many times they had forgotten. The analysis focuses on the extent of forgetting to take the pill as reported by current users and examines the associations between forgetting and various demographic and social characteristics of the users, their supply source, and whether or not the pills were provided free.

Methods

The TDHS is based on interviews of a nationally representative sample of 6,775 married women of reproductive age. The sample was designed to provide independent estimates for the four major regions of Thailand and the Bangkok Metropolitan Area, as well as for the rural and urban sectors collectively. Nationally representative results can be obtained by applying appropriate weights, and all results in this study are based on weighted calculations.

Responses from the 1,170 current pill users who were asked whether they had forgotten to take a pill during the previous month were divided into two categories: those who had forgotten to take the pill at least once and those who had forgotten three or more times. The first measure, the percentage of users who had forgotten to take a pill at least once during the last month, indicates the extent to which there is any deviation from full compliance with instructions to take the pill daily. Given that the likelihood for possible method failure increases with the number of pills forgotten within a monthly cycle, the second measure, the percentage who had forgotten at least three times, serves as an indicator of the extent of relatively serious noncompliance. Presumably, women who forget three or more times during a cycle are at significant risk of an undesired pregnancy because of incorrect method use.[3] For this reason, the second measure is of greater substantive interest than the first. (Users of all methods were asked if they had regularly used any other method during the previous month; only two percent of pill users said they had used another method, and there was very little difference between those who had forgotten one or more pills and those who had not forgotten at all.)

Cross-tabular results show the bivariate relationship between forgetting to take the pill and a number of background charac-

---

Siriwan Siriboon and Chanpen Saengtienchai are researchers at the Institute of Population Studies, Chulalongkorn University, Bangkok, Thailand. John Knodel is professor of sociology at the University of Michigan, Ann Arbor. This article draws in part on research funded by the Population Council for the analysis of the Thailand Demographic and Health Survey (TDHS). The TDHS is part of the international program of Demographic and Health Surveys (DHS), sponsored by the Institute of Resource Development and funded by the U.S. Agency for International Development.

Table 1. Percentage of oral contraceptive users who forgot to take the pill at least once and at least three times during the previous month and percentage distribution of the number of pills forgotten among those who forgot, by background characteristics

Characteristics	N	Forgot at least once	Forgot at least three times	Number of times pill forgotten among women who forgot at least once			
				1	2	≥3	Total
Total	**1,170**	**24.4**	**9.0**	**31**	**32**	**37**	**100**
Residence							
Rural	748	23.2	8.3	32	32	36	100
Less developed	642	23.2	8.2	33	32	35	100
Semiurban	106	22.9	9.2	28	32	40	100
Urban	422	29.9	12.2	27	32	41	100
Provincial	179	29.8	11.4	22	40	38	100
Bangkok	243	29.9	12.6	30	28	43	100
Woman's work status							
Agricultural	363	22.6	6.6	36	35	26	100
Nonagricultural	402	25.9	9.9	32	30	38	100
Not working	403	24.6	10.5	26	32	43	100
Education							
0–3	120	20.0	9.9	(40)	(10)	(50)	100
4–6*	852	23.8	8.9	28	34	38	100
Secondary or above	198	33.6	9.0	40	33	27	100
Age							
15–19	79	38.1	14.4	(29)	(33)	(38)	100
20–24	275	28.5	8.2	27	44	29	100
25–29	337	24.4	7.1	35	35	29	100
30–34	208	24.9	12.0	35	17	48	100
≥35	271	16.4	8.1	(26)	(22)	(52)	100
Desire for more children							
Want more or unsure	551	30.6	11.1	31	33	36	100
Want no more	608	19.0	6.9	32	31	37	100
Duration of pill use							
<1 year	399	28.1	12.5	29	26	45	100
1–2 years	322	29.8	8.4	29	43	28	100
≥3 years	442	17.4	6.5	32	29	38	100

*Includes women schooled under the old system in which primary education extended through seven years.

Notes: N refers to the unweighted number of cases. for some characteristics, the number of cases sums to less than a total of 1,170 because of missing information. In this and the next table, the results shown are based on weighted calculations. Results based on 20–49 unweighted cases are enclosed in parentheses.

teristics of the respondent that might be associated with correct use of oral contraceptives. The bivariate associations of the two measures of forgetting with the source of supply and with whether or not the pills were provided free are also shown. Finally, the association between the two measures of forgetting and a selection of the background and supply variables are explored within a multivariate framework based on logit regression analysis. The dependent variables are coded as zero for not forgetting and one for forgetting either at least once or three or more times. These results are presented in the form of adjusted odds ratios.

There are two important limitations to the present analysis. First, remembering to take the pill on a daily basis during the monthly cycle is only one of several important aspects involved in correct pill usage. For example, it is important to start a new cycle on the correct day and, if one day is missed, to take two pills the following day. A recent intensive study of pill use based on women in a local area of Colombia illustrates that the extent of errors in these other components of compliance are not trivial, especially with respect to incorrect cycle-to-cycle transitions.[4] Information on aspects of noncompliance other than forgetting to take the pill daily, however, is not available from the TDHS and thus cannot be investigated in the present study. The second limitation is that the information on forgetting to take the pill is self-reported and thus depends not only on accurate recollection of the month's events[*] but also on the respondent's understanding of which days the pill should be taken. If the woman mistakenly believes that pills should only be taken on days when intercourse occurs, for example, the extent of incorrect usage would be underreported. Unfortunately, little is known about the prevalence of various incorrect beliefs concerning proper pill usage in Thailand.

Despite these limitations, the TDHS data on pill compliance are of considerable interest and they appear to be unique. They refer to a large nationally representative sample of a major developing country, and a literature review has found no other nationally representative studies of oral contraceptive compliance in a developed or developing country.[5] In addition, Thailand is a particularly interesting case, since oral contraceptive use has been relatively high since the late 1970s. Moreover, the TDHS data are rich in information on a variety of factors that may significantly influence patterns of pill use, which enhances their value in investigating oral contraceptive compliance.

Results

Table 1 summarizes the extent to which users reported forgetting to take the pill, according to a variety of background characteristics. In addition to the two measures of forgetting (i.e., forgetting to take a pill at least once vs. three or more times), the table shows the percentage distribution of the number of times a pill was forgotten among those who forgot to take a pill at least one time. Almost one-fourth of all users reported forgetting to take at least one pill during the previous month. Among those who reported that they had forgotten at least once, slightly less than one-third each had forgotten once or twice, and slightly more than one-third had forgotten three or more times. Thus, overall, about nine percent of current pill users can be considered to seriously deviate from correct daily use during a single cycle. (Only one current pill user did not indicate whether she had forgotten to take a pill, and was excluded from the analysis; three others could not remember how many pills they had forgotten, and were treated as though they had forgotten at least three pills.)

Given the concern that rural and poorly educated women might have greater difficulty taking modern medicine correctly, the patterns of pill use associated with rural-urban residence and education are of particular interest. The TDHS results indicate that rural women are less likely to report that they forgot to take the pill during the previous month than are urban women. Moreover, when attention is focused on forgetting to take the pill three or more times, a consistent inverse association is observed between forgetting and the level of urbanization: Women in the less developed rural areas are least likely to forget, while women in Bangkok are most likely to forget.

---

[*] While it is not possible to assess directly the accuracy with which respondents were able to recall whether or not they had forgotten any pills and the number of pills forgotten, it is encouraging that virtually all the women asked were able to provide concrete responses. This was not the case for all questions in the survey. For example, more than half of the women interviewed gave responses coded as "don't know" when asked when a woman was most susceptible to becoming pregnant during her monthly cycle.

A background variable related to rural-urban residence is the type of work done by women. Based on information collected in the TDHS, it is possible to determine whether or not a woman was working and whether or not her work was agricultural. The results indicate that women engaged in agriculture reported forgetting to take the pill least frequently. In addition, there were only minor differences between women who worked in nonagricultural jobs and those who did not work.

The association between education and forgetting to take the pill also fails to show the expected relationship. Women with less than a primary education (i.e., those with 0–3 years of schooling) were the least likely to report forgetting to take the pill at least once, while women with a secondary or higher education were the most likely to do so. However, among all those who did forget, women with the least education were most likely to forget three or more times.

In general, there is a roughly inverse association between the percentage of women forgetting to take the pill at least once and the age of the user. The association between age and forgetting to take the pill at least three times is more irregular, although the youngest women still reported the highest levels. The expressed desire for no more children shows a clear association with correct pill use; among women who said they wanted no more children, the percentage who reported forgetting to take the pill was noticeably lower than among those who said they wanted more children or were uncertain. Quite plausibly, women who know they do not want any more children are more strongly motivated to practice contraception and pay greater attention to using the pill correctly. Finally, women with longer durations of pill use reported taking the pill more regularly than did women with shorter durations of use. Taking a pill daily may become a matter of habit for women who have been using oral contraceptives for a long period, whereas women with less experience may forget more easily because they have not yet become fully accustomed to the method. Alternatively, the association with duration of use may arise because women who frequently forget to take the pill switch to other methods or become pregnant.[6] Those using the pill for longer durations are thus likely to be self-selected for correct usage patterns.

In Thailand, oral contraceptives are available through a variety of sources. Since the early 1970s, government policy has been to allow trained nurses and auxiliary midwives to distribute birth control pills. As a result, all government health outlets, including the local commune health stations, provide oral contraceptives. Moreover, since 1976, all government outlets are officially supposed to provide the pill free of charge. More recently, village health volunteers have been permitted to resupply pills at a modest fee, thus further extending their availability in rural areas. Private family planning organizations, most notably the Population and Development Association, maintain a network of village-based agents as well as numerous clinics where pills are sold at modest prices. Oral contraceptives are carried by virtually every drugstore and can be purchased over the counter without a prescription.

A number of surveys conducted during the last decade in Thailand show that the majority of oral contraceptive users (among married women) obtain their pill cycles through government outlets. According to the TDHS, government sources, primarily through local health stations, accounted for 70 percent of the most recently supplied cycles.[7] In addition, 59 percent of respondents who indicated that they had obtained their most recent cycle from a government source reported that the pills had been provided free of charge. Of those who had been charged by a government outlet, the average cost was only 4.5 baht (U.S. $0.18), well below the commercial price. In the private sector, the drugstore is the most important source, accounting for 21 percent of the most recently provided cycles nationally and 61 percent of the cycles in urban areas.

As Table 2 shows, relatively pronounced differences are apparent between the extent of forgetting to take the pill and both the source of supply and whether or not the pill was provided free. Oral contraceptive users who had purchased pills from drugstores were the most likely to report forgetting to take a pill, both when measured in terms of forgetting at least one time and forgetting three or more times. Women who had obtained their last cycle at a private hospital or clinic were less likely than other women to forget to take a pill at least once, but were more likely to forget three or more times. Generally, women who had obtained oral contraceptives from government outlets reported forgetting to take their daily dose no more frequently than did women who had obtained them through a private-sector source. Moreover, women who had received their supply free from the government had forgotten less often than those who had been required to pay.

Table 2. Percentage of oral contraceptive users who forgot to take the pill at least once and at least three times during the previous month, by supply source and provision status

Source and status	N	Forgot at least once	Forgot at least three times
Source			
Government hospital	119	21.8	7.7
Government health center	542	23.6	7.3
Government volunteers	47	(17.3)	(10.5)
Private hospital/clinic	72	22.2	12.9
Drugstore	339	30.1	13.6
Shop	28	(28.0)	(6.3)
Provision status			
Government, free	424	20.6	6.9
Government, not free	278	26.0	8.7
Private	439	28.3	12.6

Given that many of the independent variables associated with forgetting to take the pill are themselves interrelated, it is useful to examine these associations within a multivariate framework to assess the influence of each particular variable, adjusting for the influence of the others. As mentioned above, we employ logit regression analysis for this purpose. Both forgetting at least once and forgetting three or more times are examined in the context of three models. The first model takes into account background characteristics but excludes supply source and free provision status. The next two models include each of these two additional variables in turn. Supply source and free provision status are not included together in the same model since they overlap with each other in their categorizations. Conducting the analysis in this manner permits assessing the extent to which incorporating supply source or free provision status reduces the observed associations between forgetting and the other background variables being examined.

Table 3. Odds ratios of forgetting to take the pill at least once and three or more times during the previous month, by selected characteristics, according to whether unadjusted or adjusted by logit regression

Characteristics	Forgetting at least once				Forgetting at least three times			
	Unadjusted	Adjusted			Unadjusted	Adjusted		
		a	b	c		a	b	c
Residence								
Rural†	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	1.41	1.25	1.21	1.23	1.50	1.69*	1.36	1.36
Education								
0–3 years	0.80	0.92	0.97	1.00	1.09	1.18	1.22	1.24
4–6 years†	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Secondary or above	1.62	1.29	1.29	1.27	1.03	0.71	0.67	0.66
Duration of use								
< 3 years†	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
≥3 years	0.52	0.66*	0.67*	0.63*	0.63	0.66	0.63	0.61*
Desire for children								
Want more/uncertain†	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Want no more	0.53	0.66*	0.67*	0.63*	0.64	0.61*	0.60*	0.60*
Age								
15–19	1.76	1.37	1.43	1.40	1.74	1.16	1.13	1.10
20–34†	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
≥35	0.56	0.89	0.85	0.86	1.03	1.60	1.59	1.68
Source								
Government outlet†	1.00	na	1.00	na	1.00	na	1.00	na
Private hospital/clinic	0.91	na	0.77	na	1.55	na	1.56	na
Drugstore	1.43	na	1.19	na	1.78	na	1.66*	na
Provision status								
Government, free†	1.00	na	na	1.00	1.00	na	na	1.00
Government, not free	1.36	na	na	1.36	1.39	na	na	1.57
Private sector	1.52	na	na	1.25	1.99	na	na	1.99*

*p<0.05 (using a two-tailed test). †Reference category.

Notes: a = adjusted for background characteristics only; b = adjusted for background characteristics and source of supply; and c = adjusted for background characteristics and provision status. The adjusted odds ratios are based on slightly fewer cases than the unadjusted ratios since cases with missing values for any of the independent variables included in the particular regression equation are excluded; na = not applicable.

The background characteristics chosen for inclusion in the regression analyses are residence, education, duration of use, desire for more children and age (Table 3). Since little difference is apparent in Table 1 between subcategories within the rural and urban groupings, residence is treated in the regression analysis as a simple rural-urban dichotomy. For similar reasons, durations of use of less than one year and 1–2 years are combined into a single category as are the ages 20–34. Women's work status is not included both because it overlaps with residence and because it shows a less pronounced association with forgetting to take the pill than does residence. With respect to source of supply, shops have been combined with drugstores, and government outlets of all kinds have been grouped together. All independent variables included in the regression analysis were treated as categorical and entered into the regression as a series of dummy variables.

Table 3 presents adjusted odds ratios calculated from multivariate logit regression with respect to the two indices of forgetting to take the pill; unadjusted odds ratios based on the bivariate results are also shown for comparison. In the context of the present study, odds refers to the probability of forgetting to take the pill (at least once or three or more times) divided by the probability of not forgetting. Odds ratios above 1.00 indicate a higher degree of forgetting for women in the category under question than for women in the reference category, and odds ratios below 1.00 indicate a lower degree of forgetting for women in the category under question compared with those in the reference category. Adjusted odds ratios represent the result after taking into account the influence of the other variables included in the table column. For example, the adjusted odds ratio of 1.29 in the second column for women with a secondary or higher education with respect to forgetting to take the pill at least once means that the odds of forgetting are 29 percent higher for such women than for those with 4–6 years of schooling (the reference category) after controlling for all other variables for which values are given in that column.

The logistic regression results indicate that urban as opposed to rural residence continues to be associated with an increased chance of forgetting to take the pill even after other influences are taken into account. The results are statistically significant, however, only for forgetting three or more times and only when the source of supply and provision status are not included. Introducing either of these factors into the analysis has little impact on the odds that urban residents will forget at least once, but it does lower the odds considerably with respect to forgetting three or more times. This would suggest that part of the rural-urban difference in forgetting may result from differences in contraceptive sources and the type of service provided in each area.

The association between education and forgetting to take the pill is more complex, and the direction of the relationship differs according to whether the analysis focuses on forgetting at least once or forgetting three or more times. With respect to forgetting at least once, there is little difference between women with less than a complete primary education (0–3 years of schooling) and those with a complete primary education (4–6 years, the reference category). However, women with a secondary or higher education are more likely to forget at least once even when other possible influences are taken into account. In contrast, the pattern of odds ratios relating to forgetting three or more times indicates an inverse association—the least educated women are most likely to forget, and women with a secondary or higher education are least likely to forget; however, the associations between education and forgetting to take the pill are not statistically significant. Introduction of the source of supply or free provision status into the analysis has little impact on these associations.

When other variables are taken into account, both duration of use and desire for more children continue to show relatively strong associations with the extent to which women forget to take pills. Moreover, most of these associations are statistically significant. Compared with other women, those who have used the pill for three or more years and those who want no more children are less likely to forget either at least once or three or more times.

After controlling for other variables, younger users (15–19 years) remain more likely to forget to take the pill at least once than women of intermediate ages (20–34 years) but they show only marginally higher odds ratios with respect to forgetting three or more times. Older women are less likely to forget at least once, but are more likely to forget three or more times than are intermediate-age women. Results with respect to these age variables, however, are not statistically significant.

Compared with users who are supplied by government outlets, women who obtain their pills from private hospitals or clinics are somewhat less likely to forget at least once but are more likely to forget three or more times, after adjusting for the other variables included in the analysis. Women who purchased their last pill cycle from a drugstore are slightly more likely to forget at least once but are clearly more likely to forget three or more times. The latter association is statistically significant. Increased odds of forgetting to take the pill are also associated with purchasing pills either from a government outlet or from the private sector as opposed to obtaining them free from government outlets. However, the increased odds of forgetting to take the pill are statistically significant only for women who purchased pills from the private sector and forgot to take them three or more times.

Discussion

Approximately one-fourth of pill users sampled in the TDHS reported forgetting to take at least one pill during the previous month and nine percent reported forgetting three or more times. Without comparable data from oral contraceptive users in other countries, no assessment can be made as to whether these levels of forgetting are high or low compared with those of more developed countries or the remainder of the developing world. Doubts about the suitability of oral contraceptives for the rural and poorly educated masses of Third World women receive little support from the experience of Thai women, however. Comparisons within the Thai population reveal that rural women report forgetting to take the pill less frequently than their urban counterparts. Moreover, women with less than a complete primary education or with just primary schooling are less likely to forget at least once than are better educated women (although they are more likely to forget three or more times).

The source of supply as well as whether the pill is provided free of charge as stipulated for government outlets is also associated with the extent of forgetting. Women who obtained their last cycle from a government outlet, especially if the cycle is provided free, are less likely to forget than are other users, whereas those who purchased their pills from drugstores are most likely to forget.

While direct evidence to explain these findings is not available from the TDHS, several plausible reasons for the observed patterns can be suggested. The variation in oral contraceptive use compliance with respect to the source of supply and the provision status may stem from differences in the extent of instruction and supervision provided. Women who obtain pills as new acceptors from government health personnel are likely to be informed about correct usage and the importance of not forgetting to take the pills. In contrast, women who purchase oral contraceptives in shops or drugstores are unlikely to receive such advice unless they specifically request it, and even then the information given may be incomplete or incorrect. A recent study of pill compliance in Thailand confirms that women obtaining their pills from drugstores are less likely to be advised on various aspects of use.[8] In addition, there is no certainty that pill packets sold in the drugstores come with written instructions, since packets are sometimes sold without outside packaging.

A potential explanation for the association between free provision status and forgetting also relates to the extent of instruction received concerning proper pill usage. Officially, oral contraceptives are to be provided free to all clients through government outlets; therefore, providers who levy charges at these outlets despite the policy may be less client-oriented. If so, clients at such centers might also tend to receive less instruction or supervision with respect to oral contraceptive use compared with clients of centers where the pill is provided free. Previous analysis of the TDHS data indicates that there is little apparent association between a client's ability to pay and whether or not she is charged at a government facility, suggesting that such policy is geared to the interests of local health center staff only.[9] In any event, the results are clearly contrary to any idea that women value pills less and thus are more careless in their use if the pills are provided free than if there is a charge, a proposition sometimes put forth by opponents of the free pill policy.[10]

Rural women depend on government outlets for their supply of pills in substantially greater proportions than urban women, and urban women often purchase their supplies from a drugstore. That may account in part for the more regular use found among rural users. Other factors not considered in this study, however, may also be influential. For example, rural life styles may be characterized by greater routine than urban ones, thereby facilitating other routine behaviors such as daily ingestion of the pill. In contrast, the more hectic pace and greater variation in daily activities experienced by urban women may make them more likely to forget to take the pill occasionally. To some extent, better educated women may also lead less routine lives and thus find it more difficult to remember to take the pill faithfully every day. In any event, oral contraceptives appear to be at least as appropriate a method for the rural and modestly educated majority of Thai women as for their better educated or urban counterparts.

References

1. N. Chayovan, P. Kamnuansilpa and J. Knodel, *Thailand Demographic and Health Survey 1987*, Institute of Population Studies, Chulalongkorn University, Bangkok, 1988.

2. Ibid.; and J. Knodel, A. Chamratrithirong and N. Debavalya, *Thailand's Reproductive Revolution*, University of Wisconsin Press, Madison, 1987.

3. I. Fraser and R. Jansen, "Why Do Inadvertent Pregnancies Occur in Oral Contraceptive Users?" *Contraception*, **27**:531, 1983.

4. L. Potter et al., "Oral Contraceptive Compliance in Rural Colombia: Knowledge of Users and Providers," *International Family Planning Perspectives*, **14**:27, 1988.

5. L. Potter, personal communication, Sept. 22, 1989.

6. I. Fraser and R. Jansen, 1983, op. cit. (see ref. 3).

7. S. Siriboon and C. Saengtienchai, "Oral Contraceptive Use," *Health and Population Studies Based on the 1987 Thailand Demographic and Health Survey*, Institute of Population Studies, Chulalongkorn University, Bangkok, Thailand, 1989.

8. "Pill Compliance Among Rural and Urban Pill Users," mimeographed report issued by Research and Development Center, Mahidol University; Family Health Division, Ministry of Public Health and Thailand Fertility Research Association, Bangkok, 1989.

9. S. Siriboon and C. Saengtienchai, 1989, op. cit. (see reference 7).

10. J. Knodel, T. Bennett and S. Panadilok, "Do Free Pills Make a Difference? Thailand's Experience," *International Family Planning Perspectives*, **10**:93, 1984.

Resumen

En la Encuesta Demográfica y de Salud de Tailandia se les preguntó a 1.170 usuarias de la píldora si habían olvidado alguna vez de tomarla durante el último mes, y si así fue, cuántas habían olvidado. Las respuestas indican que las mujeres rurales con poca o ninguna instrucción sí pueden ser usuarias idóneas de la píldora y aún pueden usar el método más correctamente que las urbanas con más instrucción. Los análisis bivariables y multivariables del uso y las características de las usua-

rias revelaron que las rurales, especialmente las que trabajan en la agricultura, tienen menos probabilidades de olvidarse de tomar una píldora que las urbanas. Además, es menos probable que las con poca instrucción se olviden de tomar una píldora que las mujeres con por lo menos educación secundaria, aunque cuando las primeras sí olvidan, es más probable que se olviden de tomar tres o más píldoras por ciclo. El uso correcto de la píldora está asociado con la mayor edad, el tiempo más largo de uso y el deseo de no tener más hijos. También, es más probable que las mujeres que compran la píldora en farmacias o en fuentes de aprovisionamiento del gobierno se olviden de tomarla que las que la obtiene gratis en el programa del gobierno.

Résumé

D'après les rapports de 1.170 participantes à l'étude démographique et de santé en Thaïlande qui utilisent la pilule régulièrement et à qui l'on a demandé si elles avaient oublié de la prendre le mois précédent, et, dans l'affirmative, combien de pilules elles avaient oublié, les femmes peu ou non instruites des zones rurales sont autant, et si ce n'est plus susceptibles d'utiliser les contraceptifs oraux correctement et de façon continue que ne le sont les femmes instruites des zones urbaines. Des analyses à deux et plusieurs variables de l'utilisation de la pilule et des antécédents ont révélé que les femmes des zones rurales, surtout celles travaillant dans le secteur agricole, sont moins susceptibles d'oublier de prendre la pilule que ne le sont leurs homologues des zones urbaines. Les femmes peu instruites sont aussi moins susceptibles d'oublier de prendre la pilule que ne le sont les femmes ayant au moins une instruction secondaire, bien qu'elles soient plus susceptibles d'oublier de prendre au moins trois pilules. L'utilisation correcte de la pilule était associée à un âge plus avancé, à une durée plus longue de pratique contraceptive et au désir de ne plus avoir d'enfants. Les femmes qui achètent les pilules auprès de pharmacies ou de sources gouvernementales sont aussi plus susceptibles d'oublier de les prendre que les femmes qui se les procurent gratuitement auprès de centres gouvernementaux.

Contraceptive Failure . . .

(Continued from page 15)

peut être considérée comme une méthode contraceptive idéale pour le couple type qui est susceptible de se conformer moins que le couple qui se porte volontaire pour un essai clinique. La probabilité d'une grossesse accidentelle est la plus élevée lors de la violation de l'une quelconque des trois règles les plus importantes: pas de rapports durant les jours de mucosités, durant les trois jours suivant celui de la fécondité maximale ou durant les moments de stress. Les personnes ayant une attitude négative à l'égard des règles sont plus susceptibles de prendre des risques, y compris des risques importants. Les personnes qui s'en tirent en prenant un risque (à savoir celles qui ne sont pas enceintes) sont très susceptibles de prendre des risques à nouveau. Etant donné que la violation des règles les plus importantes comporte un risque de grossesse de 28 pour cent par cycle, les personnes susceptibles de prendre des risques devraient être conseillées quant aux conséquences probables.

Family Planning: Poor Women in Rio

(Continued from page 22)

Los niveles bastante altos de esterilización y uso de píldora entre las mujeres de bajos ingresos arrojados por la encuesta resultan sorprendentes. El conocimiento y acceso a otros métodos son, sin embargo, limitados. Por ejemplo, el 15 por ciento de las esterilizadas dijeron desear otro hijo en el futuro y el 11 por ciento se creía en condiciones de tenerlo. Además, la encuesta estableció que el 43 por ciento de las actuales usuarias de píldora también fumaban y que el cinco por ciento eran, además de fumadoras, mayores de 45 años. El 50 por ciento de las usuarias de píldora dijeron haber padecido de contraindicantes como hipertensión, problemas cardíacos, diabetes, desórdenes renales o várices. Solo el 42 por ciento había consultado a un médico antes de usar anticonceptivos orales, los cuales se expenden sin receta.

Résumé

Une étude effectuée en 1984–1985 auprès de sept communautés défavorisées de Rio de Janeiro a révélé que sept pour cent des femmes sexuellement actives et âgées de 15 à 49 ans étaient enceintes, 20 pour cent avaient été stérilisées par méthodes contraceptives, et cinq pour cent étaient stériles. Les autres femmes, représentant 68 pour cent de la population étudiée, étaient fécondes: environ 42 pour cent avaient recours à une méthode contraceptive réversible et 27 pour cent n'étaient pas enceintes ou ne tentaient pas de le devenir et n'utilisaient pas de méthodes contraceptives. La pilule et la stérilisation féminine étaient les deux principales méthodes contraceptives parmi les femmes alors mariées pratiquant la contraception, étant utilisées, respectivement, par 53 pour cent et 33 pour cent.

Les niveaux relativement élevés de stérilisation et d'utilisation de la pilule relevés dans l'étude parmi les femmes à faible revenu sont saisissants. Cependant, la connaissance d'autres méthodes et l'accès à ces méthodes sont limités, et on a donc constaté que certaines femmes utilisaient des méthodes inappropriées. Ainsi, 15 pour cent des femmes stérilisées ont déclaré vouloir un autre enfant dans l'avenir, et 11 pour cent se croyaient capables de le faire. L'étude a aussi révélé que 43 pour cent des utilisatrices actuelles de la pilule fumaient, et cinq pour cent étaient des fumeuses de plus de 45 ans. Cinquante pour cent des utilisatrices de la pilule ont signalé souffrir de contre-indications à l'utilisation de la pilule telles que l'hypertension, problèmes cardiaques, diabète, troubles rénaux ou varices. Seulement 42 pour cent des femmes avaient consulté un médecin avant d'utiliser des contraceptifs oraux, lesquels sont disponibles sans ordonnance.

DIGEST

Tubal Ligation Appears to Be Gaining Greater Acceptance Among Both Women and Men in Kenya

Kenyan women who have undergone tubal ligation are generally very pleased with the method, and many would like to discuss it with other women, according to analyses of 32 focus groups conducted in Kenya.[1] Husbands of women who have been sterilized also are favorably disposed toward tubal ligation, but are less willing to talk about it with others. To avoid criticism from the extended family, most men and roughly half of the women did not tell their parents about their decision. Both men and women cite economic constraints as the primary reason for limiting family size, and most couples using reversible methods say they will likely use tubal ligation in the future. However, although tubal ligation appears to have gained acceptance among family planning users in Kenya, vasectomy is viewed very negatively by both men and women.

Eight focus groups were held in each of four Kenyan districts—Kisii, Nyeri, Eldoret and Mombasa—chosen as having populations likely to have favorable attitudes toward tubal ligation (based on the availability and use of local sterilization services). Each focus group had 6–12 participants. In each district, two focus groups consisted of women who had undergone tubal ligation; two others were made up of husbands of (other) women who had undergone tubal ligation; one group comprised women with at least five children who had used a reversible method during the previous 12 months; another was made up of women 40 or younger with at least five children who were not using a method; and two groups consisted of husbands of women comparable to those in the last two groups.

Most couples who had chosen tubal ligation as a method had previously used a reversible method, such as the pill, the IUD or injectables. Their primary motivation for sterilization was economic: Financial constraints, lack of land, expenses for children's education and daily necessities were mentioned most often. Other reasons cited for choosing tubal ligation were the woman's health and her dissatisfaction with other methods. Sometimes the husband had convinced his wife to undergo the operation; in other cases, the wife had persuaded her husband of its desirability. Family planning field workers were cited by many as having provided important information about the procedure. Some couples had waited a few years after first considering tubal ligation, having one or two additional children before finally deciding to have the operation.

None of the acceptors expressed any regret over having been sterilized, and most said they felt happier and healthier since the operation. Many women reported a new closeness in their relationships with their husbands, and men said their wives looked younger and healthier and were more loving.

Although a few of the women worried about the method failing at some time, most had no misconceptions about sterilization. However, some of the women said that others had warned them that they were "leaving children behind in their bodies" or that they would "become cold" (lose their sex drive). About half of the women who had had the operation said they had discussed it with members of their extended family, while most of the husbands had chosen not to. In general, the wife's family was more supportive of tubal ligation than the husband's.

Although most of the sterilized women and the husbands of such women had heard of vasectomy, they were unanimously opposed to it. Their reasons included the fear that vasectomy causes impotence, the concern that a man may later divorce, remarry and want more children and the belief that pregnancy is a woman's problem, so she should be responsible for preventing it.

Women who used reversible methods said they favored family planning because it enables them to rest between births and gives them more time to care for each child before the next is born. The most widely used method was the pill, but others used the IUD or injectables. Although a few men said that they would like to have more children, many expressed concern about the financial burden of educating those they already had. Most of the participants agreed that family size should be limited and that the ideal family would have 4–6 children.

As expected, the men and women who did not use contraceptives were less likely to see any need to limit childbearing, and they expressed distrust of reversible methods. However, nonusers seemed to accept tubal ligation as a possible method for those who do not want more children. "A couple should not waste time and government money on pills and the injection drug," said one participant. "Once they have enough children, they should use tubal ligation."

Knowledge of tubal ligation was widespread among focus-group participants. All of the women knew about it, although many had misconceptions about the operation itself. Women using reversible methods or no method generally considered tubal ligation to be an appropriate way to limit family size: Many of them knew someone who had had the procedure and were pleased with it. Most of the husbands of women using reversible methods or no method also had heard about tubal ligation and knew that it was permanent, but they did not know how it was performed. A few men knew women who had had the procedure, and they observed that these women were healthy and that their child-care burden had been lessened. One man suggested that such women could serve as motivators for others.

In contrast, both users and nonusers of

DIGEST

reversible methods were strongly opposed to vasectomy. One participant stated, "We have heard of men going for this sterilization, but do not make the mistake of talking of [promoting] this method in our community. It will spoil the whole exercise of family planning. Please only inform people that there is an operation for men, but don't encourage it."

Four obstacles to tubal ligation were identified among users and nonusers of reversible methods: the husband's opposition to this procedure or to family planning in general; fear of a change in family circumstances, such as divorce or the death of a child; the cost of the operation; and anticipated objections from the extended family. There was a consensus, however, that any decision regarding sterilization should be made by the husband and wife in private. Most participants said that if they decided in favor of tubal ligation, they would not tell their relatives.

The investigators caution that the attitudes expressed in this study are not nationally representative; just five percent of all Kenyan women have undergone tubal ligation, whereas half of the focus-group participants were either sterilization acceptors or husbands of acceptors. In addition, all participants lived in areas where tubal ligation is common and where knowledge of the procedure and positive attitudes toward it are more prevalent. Nevertheless, the results suggest that for women in Sub-Saharan Africa, sterilization can become an acceptable contraceptive method.

In comparing their results with those from a similar focus-group study conducted in Zaire,[2] the investigators point out major differences in attitudes toward tubal ligation. In Zaire, the operation was considered justified only for health reasons, whereas in Kenya, both men and women said that their main motivation was to reduce the economic burden of having a large family. In contrast to women in Zaire, Kenyan women who had been sterilized were willing to discuss their experience with other women, and method users with five or more children considered themselves to be potential candidates for tubal ligation.

The investigators attribute these differences to two factors. First, Kenya's population policy promotes smaller families, and many focus-group participants reported having heard this message on the radio or in community meetings. In Zaire, in contrast, family planning workers are trained to emphasize contraceptive use only for spacing purposes. Second, in Kenya, a woman can obtain a tubal ligation in one day and at a reasonable cost. Thus, there is easier access to sterilization than in Zaire, where the operation often requires both general anesthesia and a hospital stay.—*M. Witwer*

References

1. J. T. Bertrand et al., "Attitudes Toward Voluntary Surgical Contraception in Four Districts of Kenya," *Studies in Family Planning*, **20**:281, 1989.

2. K. Chibalonza, C. Chirhamolekwa and J. T. Bertrand, "Attitudes Toward Tubal Ligation Among Acceptors, Potential Candidates, and Husbands in Zaire," *Studies in Family Planning*, **20**:273, 1989.

Women in Botswana Use The Pill to Space Births, But Want Large Families

Levels of fertility in Botswana have fallen rapidly over the last decade, but remain high. There has been a substantial drop in the total fertility rate (TFR) and a concurrent increase in the use of modern methods of contraception. In Botswana, women's fertility desires and the TFR for the 1985–1988 period are almost identical (4.7 and 4.9, respectively). Most women want large families, but they are increasingly using contraceptives to delay their first birth and space subsequent births. Currently, 30 percent of all women practice family planning, and 60 percent of those women use the pill. These are some of the highlights of the 1988 Botswana Family Health Survey II (BFHS-II).[1]

The Republic of Botswana, formerly the Bechuanaland Protectorate, is a landlocked country bordered by the Republic of South Africa on the south and southeast, Zimbabwe on the northeast, Zambia on the north and Namibia on the west. The Kgalagadi (Kalahari) Desert covers 84 percent of Botswana's territory; as a result, 87 percent of the population lives in the eastern part of the country, where the climate is more suited to agriculture. At its current annual growth rate, Botswana's population of 1.2 million may double in less than 20 years.

In 1988, 30 percent of women of reproductive age lived in urban areas and 70 percent in rural areas, 24 percent of women had no education and 26 percent had at least some secondary education; in 1981, according to census data, 21 percent of women of reproductive age lived in urban areas and 79 percent in rural areas, 35 percent of women were uneducated and nine percent had at least some secondary education.

Fertility

The BFHS-II was carried out in 1988 among a sample of 4,368 women aged 15–49 as a sequel to the 1984 Botswana Family Health Survey (BFHS). At the time of the survey, 28 percent of the women were married and 11 percent were cohabiting. However, in Botswana, marriage and cohabitation are not good proxies for exposure to the risk of pregnancy: In 1988, the median age at first union was 24, while the median age at first sexual intercourse was just over 17. Moreover, almost half of never-married women and women formerly in a union had had sexual intercourse in the month preceding the survey. Although there was no difference in the age at which urban women and rural women first had intercourse, women with some secondary education were generally older at first intercourse than were uneducated women (17.9 vs. 16.9).

A comparison of data from the 1981 census, the BFHS and the BFHS-II suggests a substantial decrease in fertility: The TFR was 7.1 in 1981, 6.5 in 1984 and 5.0 in 1988. However, further analysis is needed to determine the accuracy of those rates. The decline appears to have occurred in all socioeconomic groups, as measured by educational level. Furthermore, the rapid increase in the proportion of educated women could be an important factor in fertility decline. Educational level is strongly associated with fertility: In 1988, the TFR among women with no education was almost twice that of women with at least some secondary education (6.0 vs. 3.3). In addition, the fertility of rural women was higher than that of urban women (5.4 vs. 4.1).

The median age at first birth among women aged 20–24 at the time of the survey was 19.7 years and appears to have changed little over time. Only two percent of the women surveyed had had their first child before age 15, but 47 percent had had their first child when they were 15–20. On average, women with at least some secondary education were 1.7 years older at first birth than their counterparts with no education (20.8 vs. 19.1).

Almost all women in Botswana breastfeed their infants, most through the first year of life and well into the second. On average, mothers breastfeed for 19 months. As a result, postpartum amenorrhea lasts for an average of 12 months;

moreover, sexual abstinence is observed for an average of 13 months after birth. Because some couples observe sexual abstinence for substantially longer than the average period, the mean length of time during which women are not susceptible to the risk of pregnancy after childbirth is almost 16 months. The duration of breastfeeding and postpartum abstinence is longer among rural women than among urban women. Therefore, rural women are protected from the risk of pregnancy for five months longer after childbirth than their urban counterparts (17 months vs. 12 months). Compared with women with no education, women with at least some secondary education breastfeed for a shorter period of time (20 months vs. 16 months), abstain from intercourse longer (12 months vs. 13 months), experience a shorter period of postpartum amenorrhea (13 months vs. 10 months) and are protected from the risk of pregnancy for a shorter period of time (16 months vs. 15 months).

Contraceptive Knowledge and Use

In 1988, 95 percent of the women in Botswana knew of at least one modern method of contraception, compared with 75 percent in 1984. The pill (95 percent), the IUD (89 percent) and injectables and the condom (88 percent each) were the most widely recognized methods. Female sterilization (58 percent), the diaphragm (51 percent) and male sterilization (23 percent) were the least well-known contraceptive options. Women's knowledge of modern contraceptive methods varied little by whether or not they had ever been in a union, by rural or urban residence or by age. However, 99 percent of women with at least some secondary education knew a modern method, compared with 87 percent of those with no education. More than 95 percent of the women surveyed named a government facility as the source they would use to obtain contraceptives, regardless of the method used.

More than half of the women in Botswana have used a modern method of contraception at some time, with the pill (46 percent), the IUD (13 percent) and injectables (10 percent) being the most popular methods. Since the initiation of the national family planning program in 1973, increasing proportions of women have practiced contraception to delay their first birth and to space subsequent births: Among women aged 20–24, 20 percent used contraceptives prior to their first birth and 31 percent did so after their first birth; among women aged 40–49, those proportions are four percent and eight percent, respectively.

At the time of the survey, 30 percent of the women in Botswana were using contraceptives. Almost all of those women were using a modern method, with 60 percent relying on the pill, 15 percent on the IUD, 11 percent on injectables, seven percent on female sterilization and four percent on condoms. Traditional methods accounted for less than three percent of all contraceptive use. Although overall prevalence increased by only six percentage points between 1984 and 1988, the proportion of use accounted for by modern methods rose from 68 percent to 98 percent. The proportion of users relying on the pill increased by 67 percent, while the proportion using injectables more than doubled. In 1988, the use of modern methods was greater among urban women than among rural women (38 percent vs. 25 percent) and rose with increasing levels of education (17 percent of women with no education vs. 40 percent of those with at least some secondary education). Almost all women using modern methods obtained them from government facilities (94 percent).

Of the sexually experienced women not using a contraceptive method at the time of the survey, 47 percent intended to begin doing so in the next 12 months, five percent intended to start later and three percent intended to, but were not sure when; 40 percent did not intend to use contraceptives, and five percent were unsure. Most of the women intending to use contraceptives in the next 12 months planned to use the pill (60 percent), the IUD (15 percent) or injectables (16 percent). Among those who were in a union at the time of the survey, 57 percent believed their partner approved of family planning, 32 percent thought their partner disapproved and nine percent were unsure. The proportion of women who thought their partner approved ranged from 43 percent among uneducated women to 82 percent among women with at least some secondary education. However, 28 percent of the women in a union had never discussed family planning with their partner, 43 percent had done so once or twice and only 27 percent had done so more than twice.

Overall, women in Botswana consider 4.7 children ideal. Those with no education want more children than those with secondary or higher education (5.6 vs. 3.9), and rural women want more children than urban women (4.9 vs. 4.4). The ideal number of children decreased from 6.2 among women aged 45–49 to 3.7 among those aged 15–19. At the time of the survey, 57 percent of the women in a union wanted another child, 33 percent wanted no more children or were sterilized, four percent were undecided and five percent were infecund. Among women in a union, 61 percent of those with four children, 44 percent of those with five children and 24 percent of those with six or more children wanted another birth. Forty-two percent of those who wanted another child wanted one within two years, 51 percent wanted to wait at least two years and seven percent were unsure how soon they wanted another child. Of all births in the 12 months preceding the survey, 52 percent were mistimed (wanted, but at a later time) and an additional six percent were unwanted.

Maternal and Infant Health

According to BFHS-II data, infant mortality decreased from 57 deaths per 1,000 births during 1973–1977 to 37 deaths per 1,000 births during 1985–1988. Over the same interval, the childhood mortality rate fell from 33 to 16 per 1,000 and the under-five mortality rate decreased from 89 to 53 per 1,000. However, these results should be interpreted with caution, because infant mortality rates for 1977–1981 estimated from 1981 census data and 1984 BFHS data (71 and 70 deaths per 1,000 births, respectively) are significantly higher than the rate calculated from BFHS-II data for that period (42 per 1,000).

The under-five mortality rate calculated for the 10 years preceding the BFHS-II was 56 deaths per 1,000, with very little difference between births to urban women and those to rural women. However, under-five mortality ranged from 64 per 1,000 among uneducated women to 47 per 1,000 among women with at least some secondary education. Infant mortality was highest among babies born to mothers aged 20–29 and lowest among those born to mothers younger than 20 (42 vs. 35 deaths per 1,000 births). Nevertheless, the under-five mortality rate varied by only one percentage point across all three maternal age-groups. The risk of dying before age five was higher among second-born and third-born children than among first-born children (62 vs. 47 per 1,000), and was more than twice as high among infants born within two years of the preceding birth as among those born after an interval of at least four years (89 vs. 42 deaths per 1,000).

The mothers of 92 percent of the infants born in the five years preceding the survey received prenatal care from a nurse-midwife or a doctor. During the same period, 85 percent of the mothers were vaccinated against tetanus. Overall, more than 75 per-

DIGEST

cent of deliveries were attended by trained health personnel: Women with at least some secondary education, those living in urban areas and those younger than 25 were more likely to be assisted at birth by a doctor or nurse-midwife than were women with no education, those living in rural areas or those older than 24.

Almost nine in 10 women had heard of AIDS, and 87 percent of those women had accurate knowledge about at least one route of transmission. The most frequently mentioned means of infection were multiple partners (75 percent), having sex with a person with AIDS (28 percent) or having sex with a prostitute (16 percent). Limiting sexual partners was the most frequently cited way of avoiding infection (73 percent), followed by using condoms (42 percent), avoiding prostitutes (14 percent), avoiding dirty needles (nine percent) and avoiding blood transfusions (seven percent).—*F. Althaus*

Reference

1. Central Statistics Office (Ministry of Finance and Development Planning), Family Health Division (Ministry of Health) and Institute for Resource Development/Macro Systems, Inc., *Botswana Family Health Survey II, 1988*, Gaborone, Botswana, and Columbia, Md., Aug. 1989.

Developing Country Pill Users Experience Small Rise in Blood Pressure

Compared with IUD users, pill users in both developed and developing countries experience a small increase in blood pressure at the end of one year of use, according to the results of a multicountry study of the effects of oral contraceptives on blood pressure.[1] However, this increase is unlikely to contribute substantially to hypertension. A companion study found no significant differences in blood pressure change between women taking pills containing 30 mcg of estrogen and those taking 50 mcg of estrogen.[2] Although most previous research has shown that the pill does induce changes in blood pressure, this work has been done primarily in developed countries, where the prevalence of cardiovascular disease and hypertension is high. Both new analyses allow researchers to evaluate the effects of the pill on blood pressure among women in developing countries, where relatively fewer women smoke and where socioeconomic factors dictate a difference in salt intake and other dietary influences.

To analyze changes in blood pressure among oral contraceptive users and IUD users, researchers working with the World Health Organization collected data from 10 centers in three developed and six developing countries.* Beginning in the late 1970s, new contraceptive users at each center who chose the pill as their method were randomly assigned to groups receiving one of various compositions of the pill available at that center. Because all centers distributed a pill containing 250 mcg of the progestogen levonorgestrel and 50 mcg of the estrogen ethinyl estradiol, the analysis compared women who used this particular dosage of pill with new users at each center who selected the IUD as their method of contraception. Women aged 18–34 were eligible for the study, provided they met a number of medical requirements, including regular menses, no recent use of hormonal contraceptives, blood pressure of 140/90 or less and no history of diabetes, abnormal Pap smear, liver dysfunction, thromboembolism, cerebrovascular disorder or reproductive tract malignancy.

At the initial visit, investigators took a medical and reproductive history, collected data on a number of socioeconomic variables and determined the woman's blood pressure. Subsequent visits at three-month intervals allowed investigators to update data and determine new blood pressure levels. Data from all participating centers were analyzed centrally, and any women not meeting the study criteria were excluded. Of the 1,554 women recruited into the study (770 in the pill group and 784 in the IUD group), nine percent of pill users and 10 percent of IUD users were found to be ineligible and were retrospectively excluded, leaving 704 and 703 patients, respectively, for analysis. The number of women available for analysis declined at each three-month interval, with 61 percent of pill users and 69 percent of IUD users still enrolled in the study at 12 months.

Overall, readings for both systolic and diastolic blood pressure declined by about three mmHg over the course of the study among the IUD users. Among pill users, blood pressure tended to rise initially and then remain constant or decline. As a result, the change in systolic pressure among pill users in comparison with IUD users was an increase of just under four mmHg at three months to five mmHg at 12 months. Diastolic pressure readings increased by about 2.5 mmHg over those of IUD users. The differences in change between the pill users and the IUD users were highly significant ($p<0.001$). A pill-induced change in blood pressure occurred in all 10 of the centers in the study, but the size of the increase was largest in Moscow—10.4 mmHg for systolic pressure and 6.9 mmHg for diastolic. Relatively large changes were also recorded in Manila, Singapore and Bombay, and the response was smallest in Santiago (Cuba), Havana, Bangkok and Lusaka. These differences between centers could not be explained by climate, economic development or other variables measured in the study.

Hypertension was diagnosed in four women in the pill group; no women in the IUD group developed hypertension. The cumulative life-table rate of hypertension among pill users was 0.78 per 100 woman-years of use.

A regression analysis controlling for such variables as baseline blood pressure, age, ponderal index (body weight divided by stature), history of hypertension in pregnancy, room temperature and family history of hypertension, stroke and heart disease did not explain the differences between pill and IUD users in blood pressure change. However, age and ponderal index at recruitment did predict the change in diastolic pressure, independently of pill use; the increase was associated with older age and heavier weight. But, these factors had little effect on systolic pressure change. Warmer room temperatures were associated with reductions in blood pressure.

The researchers believe they have been able to avoid a number of pitfalls in research on blood pressure and pill use by comparing changes in blood pressure rather than absolute levels of blood pressure, which may vary according to the characteristics of women who choose each method. The researchers note that most of the change in blood pressure associated with pill use—a difference of five mm at the end of one year—was already clear at the three-month and six-month intervals.

The researchers conclude that oral contraceptives do appear to cause a small transitory increase in both systolic and diastolic blood pressure, but that "it seems unlikely that oral contraceptive use will contribute substantially to hypertension and its sequelae." They add, "While it is sound to recommend screening prior to oral contraceptive use and monitoring of blood pressure in . . . users, the absence of facilities for doing so should not create a barrier to the use of oral contraceptives."

---

*Centers in developed countries were located in Bratislava, Czechoslovakia; Ljubljana, Yugoslavia; and Moscow, USSR. Centers in developing countries were located in Bangkok, Thailand; Bombay, India; Havana and Santiago, Cuba; Lusaka, Zambia; Manila, Philippines; Santiago, Chile; and Singapore.

The second study, involving many of the same centers as the first analysis, examined whether the estrogen component of the pill is responsible for the apparent increase in blood pressure among pill users. Past research has offered no clear-cut answer to this question, with some analyses implicating the estrogen component of the pill and some implicating the progestogen. The study comprised women in six centers* who had been randomly assigned to one of two possible pill dosage groups; both groups received pills containing 250 mcg of the progestogen levonorgestrel, but in one group the progestogen was coupled with 50 mcg of ethinyl estradiol and in the other with a 30 mcg dose. The same criteria for enrollment in the study were used as in the previous analysis, and neither the patient nor the data collector knew which pill the patient was taking.

Of the 737 patients enrolled in the study, 363 received the pill with 50 mcg of estrogen and 374 received the pill with 30 mcg. At the time the data were analyzed, six percent of the 50 mcg group and nine percent of the 30 mcg group were excluded because they did not meet the eligibility criteria. Thus, data on 680 women divided equally between the two groups were included; 65 percent of women in the high-estrogen group and 57 percent of pill users in the low-estrogen group completed all four of the follow-up visits occurring at three-month intervals following enrollment. A within-center comparison of the demographic and health characteristics of the women in the two pill groups found no significant differences, nor was there a significant difference in baseline blood pressure levels. There were, however, not unexpected differences between centers in baseline levels, which may be at least partially attributable to country variations in ponderal index.

An overall comparison and a comparison within each center of blood pressure change among women taking the higher estrogen pill versus those taking the lower estrogen dose found no significant differences between the two groups. However, because the sample sizes in each center were small (ranging from 32 to 85), confidence intervals were wide, and differences of up to three mm in measuring systolic pressure and two mm in diastolic pressure cannot be ruled out. Although the study was only of pills containing relatively low doses of estrogen, the researchers believe that their results provide some evidence against hypotheses that estrogen or the ratio of estrogen to progestogen cause pill-induced changes in blood pressure.—*J. Johnson*

---

*Centers in Bangkok, Thailand; Bombay, India; Lusaka, Zambia; Manila, Philippines; Santiago, Cuba; and Szeged, Hungary.

References

1. Task Force on Oral Contraceptives, World Health Organization (WHO) Special Programme of Research, Development and Research Training in Human Reproduction, "The WHO Multicentre Trial of the Vasopressor Effects of Combined Oral Contraceptives: Comparisons with IUD," *Contraception*, **40**:129, 1989.

2. ——, "The WHO Multicentre Trial of the Vasopressor Effects of Combined Oral Contraceptives: Lack of Effect of Estrogen," *Contraception*, **40**:147, 1989.

Haitian Fertility Rate May Have Risen in 1980s; Contraceptive Use Levels Remain Very Low

Fertility appears to be increasing in Haiti, while levels of contraceptive use have changed little since 1977. The average Haitian woman has more than six children, and only eight percent of married women currently use contraceptives. Although infant mortality has declined during the past 10 years, improvements in sanitation and vaccine coverage, as well as oral rehydration therapy, are needed. These are some of the findings of the 1987 Haitian Survey on Mortality, Morbidity and Utilization of Services (EMMUS), conducted by the Institut haïtien de l'enfance and Johns Hopkins University, in collaboration with the Haitian Ministry of Public Health and Population.[1]

Haiti's total population is estimated to be six million, and the annual growth rate is 1.7 percent. Forty percent of all Haitians are younger than 15, and 56 percent are between the ages of 15 and 60. Life expectancy at birth is about 53 years. Large families are viewed favorably in Haiti, and children are expected to provide economic security for their parents. Most Haitians (76 percent) live in the mountainous rural areas, and half of all urban residents live in the capital, Port-au-Prince. Although Haiti's economy is predominantly agricultural, only one-third of the land is arable. Agricultural output is limited by poor farming methods, population density, inadequate land distribution and extensive deforestation.

Approximately 63 percent of Haiti's people are illiterate, and fewer than 10 percent are employed in the industrial sector. Nearly 80 percent are Catholic, but the majority of Haitians also practice the voodoo religion. Many Haitians, especially those in rural areas, lack access to potable water, toilets or adequate housing. Food and medical care are scarce, and transportation is difficult. Chronic malnutrition and infectious and parasitic diseases are widespread.

The EMMUS had two definite target groups: women of childbearing age during the five years preceding the survey (those aged 15–54 at the time of the survey) and children under age five. The sample included clusters of households from three strata: metropolitan (persons residing in Port-au-Prince), other urban and rural. In all, 4,026 households were included, comprising 4,976 women and 3,994 children.

Twenty percent of the women surveyed were aged 15–19, 19 percent were 20–24, 18 percent were 25–29 and 14 percent were 30–34. Women in rural areas were somewhat older than their urban and metropolitan counterparts. Fifty-five percent of all respondents had had no schooling, 13 percent had had some primary education, 19 percent had completed primary school and 13 percent had had some secondary education. The proportion of uneducated women in rural areas (65 percent) was roughly twice that in urban or metropolitan areas (34 percent and 36 percent, respectively).

Marriage and Fertility

Sixty percent of the women interviewed were married (including those in stable nonlegal unions), 16 percent were never-married (or never-in-union), 12 percent were engaged (including those in transitory unions without cohabitation), nine percent were separated or divorced and three percent were widowed. Proportionally more rural women were married than were women in other areas. Age at marriage has decreased steadily during the last decade. In 1987, 14 percent of women aged 15–19 were married and 30 percent were engaged, compared with just five percent and 14 percent, respectively, in 1977. By

DIGEST

the ages of 20–24, 56 percent of respondents in 1987 were married and 20 percent were engaged, compared with 27 percent and 24 percent, respectively, in 1977. Finally, 77 percent of women aged 25–29 in 1987 were married and seven percent were engaged, compared with 54 percent and 19 percent, respectively, in 1977.

According to the EMMUS, the total fertility rate (TFR) in Haiti was 6.3 lifetime births per woman for the period 1982–1987. This rate represented an increase from a rate of 5.5 in 1974–1977 and 5.9 in 1982–1983, based on data from the 1977 Haiti Fertility Survey and the 1983 Contraceptive Prevalence Survey, respectively. The investigators note that the apparent increase in fertility may be partly related to more complete reporting by women or the higher quality of the EMMUS compared with earlier surveys, but that an increase of 0.5 children per woman during the last 10 years is probable. They attribute this to the earlier age at marriage and perhaps less reliance on breastfeeding. The 1982–1987 TFR among rural women (7.1) is about two children more, on average, than that among urban or metropolitan women (4.8 and 4.6, respectively). The investigators note that rural women are more likely than others to be in stable, long-term unions.

Contraceptive Use

All women were asked whether they had ever used a contraceptive method and whether they were using one at the time of the survey. Results are reported for all women aged 15–49 who were ever married or ever in union, including those who were engaged. Overall, 12 percent of ever-married women said they had used a method at some time. Ever-use was higher among women in Port-au-Prince (19 percent) and urban areas (17 percent) than among rural women (nine percent); the investigators suggest that this difference is probably due to the lack of health services, including family planning services, in rural areas as much as to any difference in demand.

Seven percent of ever-married women said they were currently using a method. Current use of contraceptives was twice as high among women in Port-au-Prince (11 percent) as among rural women (five percent); eight percent of urban women reported current use. Overall, five percent of currently married women said they were using a modern method (the pill, the IUD, the condom, sterilization, injectables or spermicides). The prevalence of modern method use was four percent in rural areas, six percent in urban areas and eight percent in Port-au-Prince.

Contraceptive use among Haitian women increases with age, parity, level of education and stability of the union. Among ever-married women, only two percent of those aged 15–19 were using a method at the time of the survey, compared with eight percent of those aged 35–49. Five percent of all women with no education and nine percent of those with some secondary education were practicing contraception. Parity appears to be even more influential in increasing contraceptive use: For women with no education, current use rose from two percent among those with no children to nine percent among those with four. Among women with some secondary education, contraceptive use rose even more dramatically as parity increased, but the numbers were too small to make a reliable comparison. Eight percent of married women reported current contraceptive use, as did five percent of women who were widowed, separated or divorced, and two percent of those who were engaged.

The four most popular methods among women practicing contraception were the pill (cited by 36 percent of all method users); tubal ligation (17 percent); the rhythm method (13 percent); and injectables (12 percent). The pill was the most popular method among women aged 20–24 and 25–34 (chosen by 45 percent in each age-group), while tubal ligation was chosen most often by women aged 35–49 years (35 percent).

Marital status exerts an important influence on method choice. Respondents who were engaged tended to use either the rhythm method (48 percent) or the pill (41 percent), while those who were divorced, separated or widowed mainly used the pill (54 percent) or injectables (22 percent). In contrast, married women used a variety of methods, including the pill (33 percent), tubal ligation (20 percent) and rhythm and injectables (12 percent each). Not surprisingly, women relying on tubal ligation were almost exclusively married. However, although married women were the exclusive users of condoms, only three percent reported that they used them. The investigators are puzzled by this finding, since more than 10 million condoms are distributed each year in Haiti.

Infant and Child Health

The EMMUS used direct and indirect methods to estimate rates of infant and child mortality. The direct method (calculating the probabilities of dying by a given age directly from the maternal history data on all recorded live births) yields an infant mortality rate for 1982–1987 of 101 deaths per 1,000 live births, a probability of death before age five of 151 per 1,000, and a neonatal mortality rate (deaths among infants younger than one month) of 43 per 1,000. Neonatal mortality is clearly higher for male than for female infants, but females have a higher death rate than males between the ages of 12 and 23 months. The indirect method (calculating the proportion of child deaths according to the age of each mother interviewed) yields an infant mortality rate of 123 per 1,000 and a probability of death before age five of 181 per 1,000. The investigators conclude that the actual death rates among Haitian infants and children are somewhere between these two estimates.

According to either method, the infant mortality rate in Haiti has declined by 20 percent since 1977, and the probability of death before age five has declined by 35 percent. Furthermore, infant mortality appears to have fallen during the four years preceding the EMMUS, although no such trend is seen for neonatal mortality.

The EMMUS found that half of all deaths among neonates are from unknown causes, while more than half of all deaths among older infants and children are related to either infectious respiratory illnesses or diarrhea. Tetanus causes 13 percent of neonatal deaths, but none among older infants or children.

Information about infant and child health was provided by the child's mother in 88 percent of cases, and by another adult in 12 percent. Forty-three percent of children younger than five had suffered from diarrhea in the two weeks prior to the survey, and 14 percent in the preceding 24 hours. Infants aged 6–11 months appear to be at highest risk for diarrhea, as are those who are not exclusively breastfed. Not surprisingly, children living where there is potable water and latrines are at lower risk for diarrhea than are those without access to either of these amenities.

The major types of treatment for diarrhea varied by area of residence: In rural areas, 35 percent of infants and children who had diarrhea 24 hours before the survey were given no treatment, 22 percent were given traditional medicine and 22 percent were given a pharmaceutical product. In urban areas, 27 percent received a pharmaceutical product, 26 percent were given nothing and 23 percent were given oral rehydration salts; in Port-au-Prince, these proportions were 43 percent, 22 percent and 19 percent, respectively. In all three areas, boys were more likely than girls to receive oral rehydration as a treatment for diarrhea. Use of oral rehydration rose as mothers' or guardians' level of education increased.

Of the 3,994 infants and children under five included in the survey, only 653 (16 percent) had received health cards issued through programs intended to monitor and improve child nutrition, notably vitamin A intake. Even so, the mothers of 51 percent of the children reported that their child had received vitamin A supplements, and among last-born infants or children, 98 percent had been breastfed. However, the survey results suggest that only about 13 percent of infants are breastfed exclusively during their first three months of life.

Fifty-eight percent of mothers of children younger than five said they had a vaccination card, but only 41 percent could produce one. Fifty-five percent of children in Port-au-Prince had cards, as did 50 percent of those in urban areas and 37 percent in rural areas. Just 15 percent of all children under five had complete vaccination coverage (that is, they had received all doses and types of vaccine recommended by that age). Complete coverage was more common among children in urban areas (24 percent) than in rural or metropolitan areas (14 percent each). Overall, 32 percent of children had received at least one dose of diphtheria, tetanus and pertussis vaccine; 33 percent had received at least one dose of polio vaccine; 63 percent had been vaccinated against tuberculosis, and 19 percent, against measles.

Twenty-seven percent of all women said they had been vaccinated against tetanus during the past five years. Of those who were pregnant at the time of the survey, 34 percent had been vaccinated in the last five years and 24 percent had been vaccinated during their pregnancy. Among the latter group, only 20 percent of rural women had received the vaccine, compared with 34 percent of urban women and 30 percent of those living in Port-au-Prince.—*M. Witwer*

Reference

1. M. Cayemittes and A. Chahnazarian, "Survie et santé de l'enfant en Haiti: Résultats de l'Enquête mortalité, morbidité et utilization des services, 1987," Institut haitien de l'enfance, Ministère de la santé publique et de la population and Johns Hopkins University, Port-au-Prince, 1989.

Rates of Expulsion, Removal for Bleeding or Pain No Higher When IUD Is Inserted During Lactation

Women who are breastfeeding at the time they have a Copper T IUD inserted fare at least as well over the next six months as do those who are not breastfeeding: They are no more likely to expel the device and are less likely to need to have their IUD removed because of bleeding or pain.[1] Because this difference remains even when the analysis is restricted to women who have resumed menstruation, the investigators conclude that there may be an advantage to having women begin IUD use while they are breastfeeding.

A multicenter study of 1,149 IUD users was conducted in 1985 and 1986 at three family planning clinics in Latin America and two in Asia. Centers could participate if their personnel had performed at least 50 IUD insertions, if they knew the breastfeeding status at the time of IUD insertion for at least 75 percent of patients, if at least 10 percent of the women were breastfeeding at the time of insertion and if the six-month follow-up rate was at least 75 percent. Women were included in the study if they had had a Copper T IUD inserted at least 42 days after their last vaginally delivered term birth. In all, 559 participants were breastfeeding (either fully or partially) at the time of insertion, while 590 were not.

The breastfeeding and nonbreastfeeding women were comparable in terms of their socioeconomic and demographic characteristics, except that at the time of IUD insertion, the former were about two and one-half years younger. None of the women experienced uterine perforation or insertion failure. The nonbreastfeeding women were significantly more likely to have felt moderate or severe pain at insertion and to have required cervical dilatation, but the proportions reporting any of these problems were very low.

One woman is believed to have been pregnant at the time of IUD insertion; none became pregnant within three months of insertion. By six months postinsertion, one breastfeeding woman had experienced a pregnancy (believed to have been caused by an unnoticed expulsion). In addition, one nonbreastfeeding woman had become pregnant, probably because of method failure.

At six months after insertion, there was no difference between nonbreastfeeding and breastfeeding women in expulsion rates (2.8 expulsions per 100 users vs. 2.5 per 100), but the former were significantly more likely than the latter to have had their IUD removed because of excess bleeding or pain (3.2 removals per 100 users vs. 0.9 per 100). As a result, nonbreastfeeding women had a method-related termination rate almost twice that of breastfeeding women (7.1 terminations per 100 users vs. 3.9 per 100). However, because breastfeeding women were more likely to have had their IUDs removed for reasons unrelated to the method (such as to become pregnant again or for personal reasons), the total termination rates after six months (8.4 per 100 users vs. 6.3 per 100) were not significantly different.

The investigators analyzed rates of expulsion and removal for bleeding or pain, after adjusting for the women's age, the contraceptive method they had used in the month before insertion, the length of the interval between their last delivery and IUD insertion, whether or not they were menstruating around the time of insertion and the center where their IUD was inserted. The introduction of these controls had no impact on the expulsion rates, but increased somewhat the difference in rates of removal for bleeding or pain. Overall, at six months after insertion, nonbreastfeeding women were more than three times as likely as breastfeeding women to have had their IUD removed for this reason (3.4 removals per 100 users vs. 0.9 per 100). The differential was even greater among women who had used either no method or a method other than the pill or IUD prior to insertion (4.5 per 100 users vs. 0.5 per 100), among those whose most recent delivery had occurred within six months of insertion (4.8 per 100 users vs. 0.5 per 100) and among those who were still amenorrheic at insertion (4.0 per 100 vs. 0.3 per 100).

Furthermore, at six months, women who were not breastfeeding were significantly more likely to have had their IUD removed because of bleeding or pain (3.2 removals per 100 users) than were those who were fully breastfeeding (0.4 per 100) or who had begun giving their infant supplements (1.4 per 100). This differential was seen even when the analysis was limited to women whose menses had resumed: 3.2 removals per 100 users among women who were not breastfeeding six months after insertion, compared with no removals among those still breastfeeding.

The investigators point out that the major difference in removal rates overall occurred in the first three months of use, when no breastfeeding women had the devices removed, compared with 2.2 removals per 100 nonbreastfeeding women. They con-

DIGEST

clude that breastfeeding women showed no adverse effects of IUD use and, in fact, "fared significantly better than the nonbreastfeeding women with regard to ease of insertion, bleeding/pain problems and overall continuation of IUD use through six months postinsertion."—*M. Klitsch*

Reference

1. I.-C. Chi et al., "Performance of the Copper T-380A Intrauterine Device in Breastfeeding Women," *Contraception*, **39**:603, 1989.

IUD Use Is Common, but Use of Hormonal, Barrier Methods Rare in Vietnam

Fertility in Vietnam appears to have declined somewhat over the past decade: The total fertility rate (TFR) among women aged 15–39 decreased from 4.6 lifetime births per woman in 1977 to 3.7 in 1987, according to data from a recent survey.[1] At the time of the survey, the mean age at first marriage for Vietnamese women was 22.4 years in the North and 24.6 in the South; one in four women aged 25–29 were still unmarried. Half of currently married women aged 15–49 reported practicing contraception, with the IUD the most commonly used method.

In 1988, with the help of the United Nations' Economic and Social Commission for Asia and the Pacific, Vietnam's National Committee for Population and Family Planning conducted a survey of 4,800 Vietnamese households. Translations of Demographic and Health Survey questionnaires (one for ever-married women aged 15–49 and one for all other household members) were used to obtain data on fertility, infant and child mortality, the use of contraceptives and marital status. Besides a national census conducted in 1979, this survey is the only published source of demographic information on Vietnam since the northern and southern parts of the country were united in 1975.

According to the survey results, over the period 1985–1987, the TFR among women aged 15–49 was 4.1 lifetime births per woman (3.6 in the South and 4.4 in the North). The researchers note that because survey data sometimes understate very recent births, 4.1 is a conservative estimate. In the North, decreases in fertility among women aged 30 or older were partially offset by increases in childbearing among women under 25, while in the South, fertility declined among women in all age-groups.

The researchers compared the survey data to an analysis of data from the 1979 census, which found that the TFR had fallen from over six births per woman in the late 1960s to fewer than five in the late 1970s. Thus, the evidence suggests that there may be an ongoing decline in Vietnamese fertility. Census data also show that fertility was lowest in the provinces with the highest degree of urbanization and education, and that the fertility decline was most rapid in the South.

The survey data indicate that the proportion of women who were single was very high, especially in the South, where one of every four women aged 25–29 were unmarried, compared with one in 10 in the North. Furthermore, among men in that age-group, one in three men in the South and one in six in the North were still single. Women's mean age at first marriage was 22.4 years in the North and 24.6 in the South; likewise, men's mean age at marriage was 24.2 years in the North and 26.3 in the South. The investigators note that the low rate of marriage may be attributable in part to the loss of men during the war and, in the South, in part to the sudden economic recession that followed the wartime prosperity of the early 1970s.

Fifty percent of currently married women reported that they were practicing contraception at the time of the survey; however, this figure is inconsistent with a TFR of 4.1, suggesting that women may have overreported contraceptive use. The IUD was the most popular method of contraception. Women in the South were more likely to rely on traditional methods such as rhythm and withdrawal than were those in the North. Very few women reported using condoms or the pill, and sterilization was rare, particularly among men.

The infant mortality rate for the 1984–1986 period was 37 deaths per 1,000 births. According to the investigators, this rate seems low for a poor country, but may be accurate, as China and Sri Lanka have achieved even lower infant mortality rates. Moreover, they point out, infant mortality was highest among uneducated Vietnamese, who made up only six percent of the sample, and fell with increasing levels of education.

As age cohorts of men not decimated by the war reach their 20s and 30s in the next few years, sex ratios can be expected to reequalize, and the prevalence of marriage most likely will increase. The investigators suggest that, in the absence of counterbalancing factors, fertility may increase, at least in the short term. However, they also comment that, given the relatively high levels of reliance on traditional contraceptive methods, Vietnamese women appear interested in limiting their fertility. "More attention should be given," they conclude, "to supplying some of the contraceptive methods, such as the . . . pill and surgical sterilization, [that] have been used so successfully in other countries in Asia."—*F. Althaus*

Reference

1. V. Q. Nhân and R. Hanenberg, "The 1988 Demographic Survey of Viet Nam," *Asia-Pacific Population Journal*, Vol. 4, No. 3, 1989, p. 3.

Mexican Fertility Falls As Female Sterilization Becomes More Popular

Mexican fertility declined through the mid-1980s, although the pace of the decline has slowed somewhat in recent years. At present rates of childbearing—which vary widely with education and area of residence—Mexican women can expect to have nearly four children by the end of their reproductive years. Thus, on average, women will have one more child than they consider to be ideal. For the first time, female sterilization is the most widely used method of contraception in Mexico, and the overall contraceptive prevalence rate among women in a union has now reached 53 percent. These are some of the highlights of the Encuesta Nacional Sobre Fecundidad y Salud (ENSFS) involving 9,310 Mexican women aged 15–49; the ENSFS was carried out in 1987 as part of the global Demographic and Health Survey (DHS) project.[1]

At the time of the survey, just over one-tenth of the respondents were illiterate; one-quarter had not completed primary school, while two-fifths had had at least a secondary education. Metropolitan-area women had obtained more education than their rural counterparts: Fifty-five percent of women in metropolitan areas had finished at least their secondary schooling, compared with just 14 percent of those living in predominantly rural areas. (Mexico has undergone rapid urbanization in the past few decades; more than two-thirds of the population now live in urban areas.) Further, women aged 15–19 were nearly eight times more likely to have finished secondary school than were women aged 45–49 (62 percent vs. eight percent).

Marriage and Fertility

According to the 1987 ENSFS, the median age at first union among women older than 25 was approximately 20 years. Rural women entered their first union three years earlier than women living in large metropolitan areas, and the differential in age at first union between uneducated women and those with a secondary education was five years. In addition, women 25–29 years old entered their first union at a slightly later age (20) than did their counterparts aged 45–49 (19). The proportions of women in each type of union have remained virtually unchanged over the past two decades: Comparing data from the 1987 ENSFS with those from the 1976 Encuesta Mexicana de Fecundidad and the 1982 Encuesta Nacional Demográfica shows that between 1976 and 1987, about 50 percent of Mexican women were legally married, nine percent were in consensual unions, 33 percent were single, and seven percent were widowed, divorced or separated.

The 1987 ENSFS also showed that 54 percent of currently married women were exposed to the risk of pregnancy, as were 43 percent of women in consensual unions, but only one percent of single women. Among women currently in a union, the most common reasons for not being at risk of pregnancy were, in descending order, not having had intercourse in the preceding month, being pregnant, being amenorrheic or being infecund.

Postpartum infecundity was estimated to last approximately eight months, taking into account the duration of postpartum amenorrhea (six months) and postpartum abstinence (five months). Survey respondents had breastfed their most recently born child for 11 months, on average. There was a strong negative relationship between the duration of breastfeeding and the level of education and area of residence: At the time of the survey, the least educated women had breastfed their babies for an average of 18 months, compared with seven months among the most educated; women living in sparsely populated rural areas had breastfed for about 14 months, compared with seven months among those living in metropolitan areas.

A question on the frequency of sexual relations was a unique feature of the Mexican DHS. Of all the women surveyed, those aged 20–24 were the most sexually active, reporting 5.7 acts of sexual intercourse during the past month. Women aged 25–29 reported the next highest coital frequency (5.4 times), followed by women aged 15–19 (5.2 times). Frequency of sexual intercourse differs most by educational attainment: Highly educated women reported having had intercourse more than six times during the preceding month, compared with just over four times among women who did not complete primary school.

Mexico's total fertility rate (TFR) fell from 6.3 lifetime births per woman in 1973 to 3.8 per woman in 1986, a decline of nearly 40 percent. However, the pace of that decline slowed appreciably in the four years preceding the survey. For example, the TFR fell by 16 percent in 1974–1978 and 1978–1982, but by 10 percent in 1982–1986. Not only have large rural-urban differentials in fertility persisted, they have widened: In 1970–1975, rural Mexican women had an average of two more lifetime births than their urban counterparts, while in 1981–1986, that differential widened to three children. Differentials in educational attainment also continue to have a substantial impact on fertility: For example, the TFR among women who had a complete primary education was 3.7, compared with 5.7 among those who did not.

Fertility has been declining among Mexican women in all age-groups, especially at the two extremes of the reproductive period. Between 1974 and 1986, the largest drop (one of 50 percent) occurred among women aged 35–39. For the period 1978–1986, the age-specific fertility rate for Mexican 15–19-year-olds fell by more than one-third, from 132 births per 1,000 to 84 per 1,000.

The results of the 1987 ENSFS suggest a trend toward a slightly higher age at first birth, although the trend is not consistent, in part because the more educated women are concentrated in the younger cohorts. Overall, educational attainment continues to exert a strong influence on age at first birth across all age-groups. For example, women with a complete secondary education had had their first child by age 24, on average, while women with no schooling had had their first child by age 19.

Contraceptive Knowledge and Use

In Mexico, the most widely known method of contraception is the pill, known by 90 percent of respondents. It is followed, in descending order, by the IUD, female sterilization and injectables (each known by approximately 84 percent of the sample), the condom and vasectomy (each known by 64 percent), spermicides and rhythm (each known by 60 percent) and withdrawal (known by slightly less than 50 percent).

Approximately 53 percent of all women in a union said they were using a contraceptive method at the time of the survey. According to the 1987 Mexico ENSFS, levels of contraceptive prevalence rose in the mid-1980s, but did so at a slower pace than over the period 1976–1982. The proportion of Mexican women in a union who were using a modern contraceptive method* reached 45 percent in 1987, after having risen steadily over two decades (from 23 percent in 1976 to 32 percent in 1979 and 42 percent in 1982). However, the pace of this increase slackened somewhat after 1982.

From 1982 through 1987, the overall method mix remained stable, with roughly 80 percent of use accounted for by modern methods, five percent by barrier methods and 15 percent by traditional methods. However, notable changes in the use of specific methods took place between 1982 and 1987: Female sterilization became the most widely used modern method among Mexican women in a union who were using a method, having increased from 28 percent to 36 percent during that period. Although vasectomy still accounts for a tiny proportion of overall prevalence (less than two percent), reliance on male sterilization nevertheless increased substantially after having remained fairly stable at under one percent throughout the preceding decade. Use of the pill dropped by almost half, from 30 percent of users in 1982 to 18 percent in 1987.

The 1987 ENSFS also contained a separate questionnaire on sterilization. Compared with users of other modern methods of contraception, sterilized respondents tended to be older, of higher parity and less educated. Further, Mexican women who had undergone sterilization had used a wider variety of methods and had used modern methods consistently more than any other users. Nearly 88 percent of the women who were sterilized claimed that they had participated directly in the decision to have the operation; however, 13 percent said that someone else had decided for them (although nine percent said they still had wanted to be sterilized).

The survey results also revealed that one-fifth of sterilized women had made the decision to have the operation just three days before; another one-fifth had waited 2–6 months after deciding and nearly one-third said that 7–12 months had elapsed between the time that the decision was made and the operation. Eighty percent of the women had had the operation in a government institution.

---

*The ENSFS categorized contraceptive methods as modern (the pill, the IUD, male and female sterilization and injectables), barrier (the condom and spermicides) and traditional (rhythm, withdrawal and herbs).

There were strong differentials by education in the proportion of women who had experienced health problems after the operation, with twice as many uneducated women as women with secondary schooling reporting such health problems (40 percent vs. 20 percent). Curiously, the relationship was reversed regarding the experience of personal or family problems: About 10 percent of uneducated women claimed they had had personal difficulties after the operation, while the corresponding proportion among women who had completed primary school was 17 percent. The most common problems were the husband's rejection and the disapproval of close relatives.

Eighty-six percent of Mexican women who had been sterilized said they would have the operation again, and 77 percent would recommend the operation to others. Both of these proportions varied most according to the length of time spent on the initial decision and the woman's level of educational attainment. Overall, nine percent of the women who had been sterilized were unsatisfied with their decision. Of these women, 36 percent wanted more children and 17 percent each either had not wanted the operation to begin with, felt ill after the operation or suffered feelings of depression or sadness.

The majority of Mexican women who practiced contraception had obtained their method through the public sector (62 percent), a proportion that has increased steadily since 1979. Among the remaining 38 percent (all of whom had gone to private providers), a higher proportion (22 percent) had gone to pharmacies than to private doctors' offices (14 percent).

Overall, 65 percent of currently married women said that they wanted no more children. As would be expected, the proportion saying they wanted no more rose with age: Forty percent of women aged 20–24, 57 percent of 25–29-year-olds and 72 percent of 30–34-year-olds reported that they had had all the children they wanted.

The Mexico ENSFS also measured how well women's reproductive intentions conform to their contraceptive practice. Among women exposed to the risk of pregnancy,* there were large differentials in method use according to parity, place of residence and education: Forty percent of uneducated women exposed to the risk of pregnancy who wanted no more children did not use a method, while the corresponding proportions among women who had completed primary school and secondary school were 11 percent and two percent, respectively. The proportions who wanted to wait more than two years before having their next child but were not currently using any method followed a similar educational pattern.

The overwhelming majority of Mexican women said that their ideal family size was three children. This ideal varied considerably by age, education, parity and area of residence, however. For example, 20–24-year-old Mexican women said an ideal family would consist of 2.6 children, while 45–49-year-olds believed that four would be ideal. Similarly, the ideal family size was 4.4 children among uneducated Mexican women and 2.5 among those with at least a secondary education.

Maternal and Child Health

According to estimates from the Mexican ENSFS, the infant mortality rate during 1982–1987 was 47 deaths per 1,000 live births, considerably less than the rate of 67 deaths for the preceding five-year period. In addition, from 1982 to 1987, 61 out of 1,000 children born in Mexico died before their fifth birthday, compared with 83 per 1,000 for 1977–1981. Differences in mortality rates according to parity were more pronounced than those related to the mother's age, and infant and child mortality rates were highest among women who had had birth intervals of less than two years. In addition, babies born in rural areas were three times more likely to have died before their first birthday than were those born in metropolitan areas, and babies born to women with no education were twice as likely to have died as were those born to women who had completed their primary schooling.

Overall, 16 percent of Mexican women who had given birth in the five years preceding the survey received no prenatal care; this proportion rose to one-third among women with no education. Sixty-eight percent of all respondents received prenatal care from a physician, while 13 percent went to a traditional midwife and three percent saw a nurse. Similarly, nearly two-thirds of all Mexican babies were delivered by physicians and just one-fourth by traditional midwives. It is worth noting that one-fifth of all births in metropolitan areas were delivered by cesarean section, a finding that reflects both the increased availability of medical services and the higher overall socioeconomic status in such areas.

Nearly one-quarter of children under age five had had diarrhea in the two weeks before the survey. Of these, 85 percent had received some kind of treatment, but only four percent were treated with oral rehydration salts.—*L. Remez*

Reference

1. Dirección General de Planificación Familiar, Subsecretaria de Servicios de Salud, Secretaria de Salud, *Encuesta Nacional Sobre Fecundidad y Salud, 1987*, Institute for Resource Development, Mexico City, July 1989.

---

*Defined as women who are not pregnant, who are not experiencing postpartum amenorrhea, who are not sterile, who have had sexual relations during the month preceding the survey and who had their last menstrual period within the past two months.

Books in Review

A Unique Response to Population Growth

Community Development and Family Planning: An Egyptian Experiment
by J. Mayone Stycos, Hussein Abdel Aziz Sayed, Roger Avery and Samuel Fridman, Westview Press, Boulder, Colo., 1988, $36.00, 224 pp.

Reviewed by Susan H. Cochrane

Historically, geographically and demographically, Egypt is unique. Its geographic and historical distinctiveness lie in its position as a crossroads between Europe, Africa and Asia. Its culture and agriculture have been fed from the south by the Nile River and the cultures of Africa, overlaid in relatively modern history by Greek and Roman influences and, subsequently, by the Arabs and the influx of Islam.

This setting is highly relevant to the current demographic situation of the country, in which there are really three Egypts: the comparatively modern and cosmopolitan cities of Cairo and Alexandria, and the two rural areas of Upper Egypt and Lower Egypt. This book by J. Mayone Stycos and colleagues concerns the rural areas. The authors recognize, and their findings support, the fact that Upper Egypt is the much more traditional and underdeveloped of the two and is also less influenced by Europe and Asia. One of the authors' main conclusions, which has been found elsewhere,[1] is that different policies must be designed for the two areas.

Economically, Egypt is highly dependent on a narrow strip of very fertile agricultural land that is extremely dense in population and extensively cultivated. Despite the fertility of this land, Egypt has had to rely heavily for the past 20 years on large-scale food imports and food aid. Coupled with the massive flow of people from the land into the metropolitan areas and the uncontrolled growth of these areas, this dependency forced Egyptian policymakers to recognize early on the dimensions of the population problem.

The Egyptian leadership sought to cope with the problem through a valiant attempt to industrialize, to develop new towns and to create new agricultural land through massive investment in land reclamation. It also recognized that just coping was not enough and that efforts must be made to reduce fertility. As early as the mid-1960s, with the drafting of the National Charter, Egyptian President Gamal Abdel Nasser stated that population increase was "the most serious obstacle to the efforts of the Egyptian people in their drive to increase levels of production" [p. 14]. And as Stycos and his coauthors report, Nasser stated in 1966 that family planning was to have highest priority.

Somewhat uniquely, however, Egypt took very seriously the philosophy that "development is the best contraceptive," which had been espoused by many attendees of the 1974 World Population Conference in Bucharest. Consequently, although family planning was incorporated into Egypt's health system in a rather passive way, the population strategy stressed improving the development of rural communities to indirectly bring about fertility decline. It is this experience on which Stycos and his coauthors focus.

The evolution of Egypt's population policy is well explained in the book. Understanding the reason Egypt's policy took the turn it did is perhaps easier if one remembers that at the time it was being formulated, there had been no successes in bringing about fertility decline in China, Colombia or Indonesia. Perhaps only Sri Lanka and Taiwan had had such successes, and Egyptian policymakers were faced with much higher levels of mortality and illiteracy than their counterparts in those countries. What may be more surprising is that the Egyptian policy emphasized dimensions of development that were designed more to improve income generation and fertility attitudes than to reduce mortality and illiteracy.

Community Development and Family Planning focuses on the demographic dimensions of Egypt in an attempt to determine whether the country's unique policy response to its rapid population growth succeeded. Yet it is both more and less than a program evaluation, in that the authors attempt to explore not only the role of the program in determining contraceptive use and fertility in Egypt but also the role of development policies in explaining these phenomena in general. The broader agenda of the book makes it interesting to those studying the determinants of fertility, as well as to those who wish to study the role of policy. However, as do the multiple objectives of the program itself, the multiple objectives of the book tend to confuse the issues. Another unfortunate similarity between the program and the book is the lack of a clear, overarching framework or theory that would give coherence to many worthy objectives. This said, it must be added that the book, unlike the program, is a success.

The authors evaluate Egypt's population and development program in the context of how community characteristics in general, and program inputs in particular, determine the attitudes of men and women. But preliminary to the main topic is a chapter describing the impact of contraceptive use on fertility in rural Egypt through an analysis of the effects of various proximate determinants. This analysis, as well as previous ones,[2] shows that contraceptive use has significant negative effects on fertility in Egypt. This may seem

---

Susan H. Cochrane is principal population economist in the Population, Health and Nutrition Division of the Population and Human Resources Department, The World Bank, Washington, D.C. The views expressed in this article do not reflect those of the World Bank or any individual acting on its behalf.

obvious to some, but for a couple of reasons, it may not always be the case: If the pill is available without a prescription, as it is in Egypt, then use is primarily user-controlled, and ineffective use at the hands of the poorly educated may negate most of the expected effect; in addition, those who are the most fertile may be more likely than others to practice contraception, and thus it could seem to have a positive association with fertility.[3]

It is very difficult to measure either the quality of use or whether contraceptive use is selective of those who already have more children or perceive themselves as being more fertile. In the analysis by Stycos and colleagues, the lack of a model incorporating the demand for children prevents the investigators from successfully disentangling the selectivity issue, despite great efforts. Nevertheless, they show convincingly that contraceptive use, even of the low quality that may prevail in rural Egypt, has a significant negative effect on fertility. The selectivity problem probably means that, if anything, the effect is underestimated.

The other chapters of the book are more descriptive, and thus much less subject to methodological nit-picking. These chapters provide a rich picture of fertility attitudes and contraceptive use in rural Egypt and the impact of the population and development program in shaping them. Descriptions are included of husbands' and wives' attitudes and attitude formation, the importance of region and governorate in explaining differences in these attitudes, the extent of couple exposure to the various elements in the program and the effect of program exposure on fertility and on contraceptive attitudes and behavior.

Especially interesting is the chapter entitled "Men, Women and Villages," which describes the attitudes of both men and women on a wide range of topics. The information indicates that in Egypt, husbands are not the obstacle to fertility decline that they have often been accused of being; the authors conclude this chapter by noting that "the sexes in rural Egypt think alike on a wide range of topics" [p. 66]. This observation conforms with a conclusion of the Egyptian Fertility Survey, although the latter is not cited in this work.[4] In fact, the current work and the Egyptian Fertility Survey often confirm and expand on each other's findings. The former has a wider variety of measures of fertility preferences and attitudes toward contraception, for example, while the latter has more on attitudes toward the costs and benefits of children.

The distinctive portion of this book, however, lies in its evaluation of the effect of the population and development program on these attitudes and behavior. Unfortunately, there is no one place where the program is explained in detail, and one must gather facts about it piecemeal. For example, not until page 106 does the reader learn that all villages in the program were supposed to be within walking distance of a family planning clinic. This is extremely important, since the program did not itself provide family planning. This particular design feature is generally recognized as a major flaw of the program, but the analysis does not include an objective assessment of the actual availability of family planning.

One can summarize the findings of the evaluation as follows: The population and development program appears to have had a significant effect on the knowledge of family planning and on family-size preferences; its effect on contraceptive use is less clear, varying by region, the motivation to have more children and whether weighted or unweighted observations are used; couples do not appear to have been very aware of the availability of the development projects, such as beekeeping and poultry production; the development projects did not affect knowledge, attitudes and practice, anyway; whatever impact the population and development program had was because of its family planning inputs;* and, less certainly, a scale effect appears to make greater concentration of volunteers more effective.

In the concluding chapter, the authors partially explain why the program failed: "the organizational demands on a program that attempts to integrate community development with family planning may be so great for a country such as Egypt that neither development nor family planning can be effectively delivered" [p. 176]. Stycos and his colleagues conclude that the program was not conceptually flawed because, in contrast to some other investigators, they find that community factors affect knowledge, attitudes and practice. I myself, however, am saddened by the fact that education and mortality were not pursued more rigorously in general and that the dimension of development focused on was small-scale income generation. A cost-effectiveness analysis of what it takes to raise income compared with what it would take to increase schooling and reduce infant mortality would have been an interesting guide to policy. I also believe, however, that at least in Lower Egypt, where there is unmet need for family planning, attention should have been focused on service delivery rather than on development.

Finally, while one may have desired greater crispness and methodological purity in the telling of the story, the conclusions of the book are a very respectable achievement for an evaluation of an experiment in social change.

References

1. A. M. Hallouda, S. Farid and S. H. Cochrane, eds., *Egypt: Demographic Responses to Modernization*, Central Agency for Public Mobilization and Statistics, Cairo, 1988; and S. H. Cochrane, M. A. Khan and I. K. T. Osheba, "Education, Income and the Demand for Children: A Revised Perspective," *Economic Development and Cultural Change*, **38**:313, 1990.

2. A. C. Kelley and R. M. Schmidt, "Family Planning, Socioeconomic Change and Population Policy in Egypt: An Exploratory Methodology," paper presented at the Cornell University International Population Program, Ithaca, N.Y., Apr. 30, 1984; and R. A. Easterlin, E. M. Crimmins and I. K. T Osheba, "Determinants of Fertility Control," in A. M. Hallouda et al., 1988, op. cit. (see reference 1).

3. M. R. Rosenzweig and T. P. Schultz, "The Supply and Demand for Births: Fertility and Its Life Cycle Consequences," *American Economic Review*, **75**:992, 1985.

4. A. M. Hallouda, S. Z. Amin, S. H. Cochrane and S. M. Farid, "Socio-Economic Differentials and Comparative Data from Husbands and Wives," *The Egyptian Fertility Survey, 1980, Volume III*, Central Agency for Public Mobilization and Statistics and World Fertility Survey/International Statistical Institute, Cairo, 1983.

---

*As the authors recognize, the association with respect to some of these inputs is not clear-cut. The incentive payments to volunteers are significantly related to knowledge, attitude and practice levels, but high performance in a village affects the levels of those payments.

International Family Planning Perspectives
Published quarterly by The Alan Guttmacher Institute

Editorial Office: 111 Fifth Avenue,
New York, N.Y. 10003, United States of America

Editorial Advisory Committee

Barbara M. Boland, Trinidad and Tobago

John C. Caldwell, National Centre for Epidemiology and Population Health, The Australian National University, Canberra

John Cleland, Centre for Population Studies, London School of Hygiene and Tropical Medicine, England

Mercedes B. Concepcion, The Population Institute, University of the Philippines, Manila

Ronald Freedman, The Population Studies Center of the University of Michigan, Ann Arbor

Noreen Goldman, Office of Population Research, Princeton University, Princeton, New Jersey

Roushdi A. Henin, Department of Sociology, University of Zimbabwe, Harare

Maria Helena Henriques-Mueller, Istanbul, Turkey

Shireen J. Jejeebhoy, Bombay, India

Gavin W. Jones, The Research School of Social Sciences, The Australian National University, Canberra

Lin Lean Lim, International Labor Office, United Nations, Bangkok, Thailand

Edith Alejandra Pantelides, Centro de Estudios de Población, Buenos Aires, Argentina

Allan G. Rosenfield, School of Public Health, Columbia University, New York

Nafis Sadik, United Nations Population Fund, New York

Mpembele Daniel Sala-Diakanda, Institut de Formation et de Recherche Démographiques, Yaoundé, Cameroon

Zeba Sathar, Pakistan Institute of Development Economics, Islamabad

Claudio Stern, El Colegio de México, The Population Council, Mexico City

Léon Tabah, Comité International de Coopération dans les Recherches Nationales, Paris, France

Martin Vessey, Department of Public Health and Primary Care, University of Oxford, England

This publication is partly supported by the U.S. Agency for International Development (AID) through a cooperative agreement (no. DPE-0955-A-00-3005-11) with the Planned Parenthood Federation of America/Family Planning International Assistance. The contents of this publication do not necessarily reflect the views or policies of the AID.

Credits

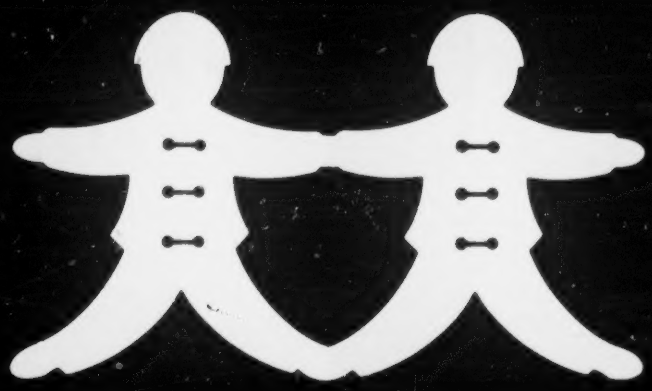
Cover design: Sheldon Cotler + Associates

Volume 16, Number 2, June 1990

International Family Planning Perspectives

Women, Work and Reproduction in Karachi
Acceptability of Contraceptive Implants
Sterilizations by Thai Nurse-Midwives

Characteristics of Only Children in China



A Publication of
The Alan Guttmacher Institute

International Family Planning Perspectives

ISSN 0162–2749
Volume 16, Number 2, June 1990

Published quarterly by
The Alan Guttmacher Institute.

President: Jeannie I. Rosoff
Director of Publications and Editor-in-Chief:
Olivia Schieffelin Nordberg

Executive Editor: Jeanette H. Johnson
Editor: Michael Klitsch
Associate Editors: Frances A. Althaus,
Martha B. Witwer
Assistant Editors: Lisa Remez, Rebecca M. Turner
Production Editor: Patricia Rind
Copy Editor: Donna Cohen
Senior Production Assistants: Eric Loddé,
Georges Louis-Jacques
Administrative Assistant: Ruth A. Zlotnick

Contributing Editor, Law and
Public Policy: Susan Cohen

Consulting Editor:
Charles Westoff

Editorial Office:
111 Fifth Avenue
New York, N.Y. 10003
United States of America

© 1990 by The Alan Guttmacher Institute, An Independent, Nonprofit Corporation for Research, Policy Analysis and Public Education; all rights, including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention for the Protection of Literary and Artistic Works and the International and Pan American Copyright Convention.

Second-class postage paid at New York, N.Y. Postmaster: Send address changes to International Family Planning Perspectives, 111 Fifth Avenue, New York, N.Y. 10003.

Table of Contents

Page

Update 42

Articles

Scholastic and Personality Characteristics Of Only Children and Children With Siblings in China — Dudley L. Poston, Jr., and Toni Falbo 45
Initial Acceptability of Contraceptive Implants in Four Developing Countries — Thomas T. Kane, Gaston Farr and Barbara Janowitz 49
Postpartum Sterilization by Nurse-Midwives in Thailand — Kanchana Kanchanasinith, Pattaka Piyapinyo, Pichit Pitaktepsombati, Suvathana Vibulsresth, D. S. Gates, Barbara Janowitz and Mark Robbins 55
Induced Abortion: A World Review, 1990 — Stanley K. Henshaw 59
Women, Work and Reproduction In Karachi — Zeba A. Sathar and Shahnaz Kazi 66

Digest

More Thai Women Now Using Contraceptives to Delay First Birth 70
In Sri Lanka, a Majority of Couples Have Talked About Family Planning 71
Pill Use Appears to Increase Risk of Liver Cancer in Women Under 50 72
In Ghana, Most Women Know a Modern Method but Very Few Use One 73
Vaginal Ring Is Effective for at Least One Year, Worldwide Trials Show 75

Books in Review

A Handbook for Family Planning Providers — Aníbal Faúndes 77
Complex Analyses, Personal Decisions — Barbara Entwisle 79
Note to Authors 44

UPDATE

A Test of the Kangaroo Method

Kangaroos are not native to Africa, but a technique derived from the way the Australian marsupial cares for her young appears to have helped low-birth-weight babies in Mozambique to gain weight and to have increased their chances of survival.[1] Dubbed the "kangaroo method" because the underweight newborn is wrapped in a pouch-like enclosure near the mother's breasts in a manner resembling the way a kangaroo mother carries her young in an abdominal pouch, the new approach keeps the baby warm and allows it to feed freely. Only five of the first 100 babies placed in the program died during the kangaroo nursing period, and the remainder were discharged after a mean hospital stay of one month; they had gained an average of 13 g per day, and nearly all were being exclusively breastfed at discharge. The investigators point out that because they could not conduct a randomized study, they cannot draw definitive conclusions about the method's safety and effectiveness. They add, however, that "considering the high late neonatal mortality rates usually recorded in [their] nursery for newborns weighing less than 1,500 g (about 18 percent), any 'technology' that can afford a 95 percent survival rate . . . should be considered highly effective."

[1] F. Colonna et al., "The 'Kangaroo-Mother' Method: Evaluation of an Alternative Model for the Care of Low Birth Weight Newborns in Developing Countries," *International Journal of Gynecology and Obstetrics*, **31**:335, 1990.

Rising AIDS Tide in Thailand

At the end of 1986, Thailand's Ministry of Public Health was reporting only eight cases of AIDS and 10 more known cases of human immunodeficiency virus (HIV) infection; by February 1990, however, there were nearly 15,000 recorded cases of HIV infection in the country, and an independent group of medical experts was estimating that the actual number of Thais infected might be 10 times the official total.[1] Thailand's National AIDS Prevention and Control Program now reports that almost half of intravenous drug users in the country are infected with HIV, and researchers believe that levels of infection among the estimated 500,000 prostitutes in Thailand are high. According to one report, 59 percent of recorded HIV infections in the province of Chiang Mai are among female prostitutes and 17 percent are among male manual workers, the most common clients of Thai prostitutes; the remaining cases have been found among students, civil servants and housewives. HIV infection appears to have spread most rapidly among women in recent years: In 1986, according to the Thai government, 17 males were HIV infected for every female; by 1990, that ratio had fallen to five males for every female.

[1] D. G. Smith, "Thailand: AIDS Crisis Looms," *Lancet*, **I**:781, 1990.

Smoking Promotes Pelvic Infection

Cigarette smoking may increase the risk of pelvic inflammatory disease (PID) among women, regardless of whether they are current smokers or only smoked in the past.[1] A case-control analysis of 192 women with PID and 642 without PID that controlled for the women's age, race, education, marital status, number of recent sex partners, frequency of intercourse, number of episodes of gonorrhea and current contraceptive method showed that current smokers are 70 percent more likely than those who have never smoked to require hospitalization for treatment of PID, and that former smokers (those who quit more than three months before the interview) are more than twice as likely as nonsmokers to develop serious PID. The researchers suggest that if this association is causal, "the predominant mechanism of action is likely to be a permanent or long-lasting change in anatomy, physiology or both that it is not yet fully understood."

[1] P. A. Marchbanks, N. C. Lee and H. B. Peterson, "Cigarette Smoking as a Risk Factor for Pelvic Inflammatory Disease," *American Journal of Obstetrics and Gynecology*, **162**:639, 1990.

Age No Bar to Male Fertility

Men aged 55 and older are only slightly less able to father a child than are younger men, according to the results of a study based on World Fertility Survey data from Cote d'Ivoire, Ghana, Kenya, the Sudan and Syria.[1] Analyses of the period of time necessary for conception showed that once the length of the marital union and the wife's age are taken into account, men aged 55 or older in three of the countries did not need significantly longer than those younger than 45 to impregnate a woman; only in Kenya and Syria, where older men needed 17 percent longer and 23 percent longer, respectively, to father a child, were the differences statistically significant. The investigators add that "in all countries except Syria, the difference in waiting time [to conception] between husbands under 45 and those aged 45–55 is only about one to two months at most [marital] durations."

[1] N. Goldman and M. Montgomery, "Fecundability and Husband's Age," *Social Biology*, **36**:146, 1989.

Poor Cancer Outcomes in Nigeria

Over the course of four years, 72 women were admitted to a Nigerian hospital for treatment of gynecologic cancer: Seventy-four percent had cervical cancer, 14 percent ovarian cancer, eight percent endometrial cancer and four percent vulvar cancer.[1] Four out of five patients came to the hospital when they were at Stages III or IV of tumor development, however, leaving them with a poor prognosis. Indeed, 11 patients (including half of those with ovarian cancer) died either on admission or shortly after diagnosis. The investigators observe that because of travel difficulties and the expense of appropriate drugs or radiotherapy, it is unlikely that women in developing countries who develop cancer can be treated or cured; thus, it is important that these countries focus as much as possible on the prevention of reproductive cancers.

1. N. D. Briggs and K. C. Katchy, "Pattern of Primary Gynecological Malignancies as Seen in a Tertiary Hospital Situated in the Rivers State of Nigeria," *International Journal of Gynecology and Obstetrics*, **31**:157, 1990.

Tips on Promoting Breastfeeding

Mass media campaigns intended to promote the practice of breastfeeding succeed or fail because of a few basic elements, according to a review of 25 such programs.[1] Most important is that programs identify the barriers to breastfeeding ahead of time and address the appropriate audience; as the reviewers point out, "depending upon the local situation, the primary target audiences may not be pregnant women and new mothers." In addition, most women already believe that breast milk is best for their babies, so general campaigns aimed at convincing women that breastfeeding is best do not further the cause. Successful programs, the investigators conclude, developed an overall communications strategy that was based on an analysis of the barriers to breastfeeding that existed locally, planned so that the promotion program could be sustained over the long term, established sound administrative and financial management, chose messages that were appropriate to their audience and ensured that they had enough funds that the program would have an impact.

1 C. P. Green, *Media Promotion of Breastfeeding: A Decade's Experience*, Academy for Educational Development, Washington, D.C., 1989.

Implant Successful in China Trials

No pregnancies were reported among 100 Chinese women relying on the NORPLANT®-2 contraceptive implant over the first year of use, and virtually all of the women continued using the method over the full year.[1] A comparison group of 100 users of a levonorgestrel-releasing IUD experienced one pregnancy over the same period. The use-related discontinuation rates for the implant and the IUD after the first year were 3.0 and 9.0 per 100, respectively. Overall, the respective one-year continuation rates were 96 per 100 and 90 per 100. However, significantly more users reported decreased menstrual flow with the IUD than with the implant (66 percent vs. 24 percent), while significantly more implant users reported prolonged bleeding (39 percent vs. 11 percent). In addition, the husbands of the implant users were more likely to say that use of the method had "disturbed family life significantly" than were the husbands of IUD users. Nonetheless, nine out of 10 women in both groups said they planned to continue using the method.

1. G. Ji et al., "Comparison of the Clinical Performance, Contraceptive Efficacy and Acceptability of Levonorgestrel-Releasing IUD and NORPLANT®-2 Implants in China," *Contraception*, **41**:485, 1990.

Sons' Value Is More Than Economic

The importance of sons to widowed mothers cannot be measured simply in economic terms, according to a village study conducted in Maharashtra, India.[1] An investigator surveyed 123 widows in a rural village, and conducted extended interviews with 30 of the widows to gather detailed information about their economic situation and daily lives. Half of the women were living with a married son, but these women tended to be economically active and did not necessarily depend on their son for support. Only one in six were living alone, and they were usually better off than those who lived with a son. The researcher comments that most of the widows expressed a preference for sons even when their sons were contributing little or nothing to their support. Son preference, she argues, often involves issues of lineage, religious oblations that only sons can perform and cultural expectations that diminish the economic role of daughters. The investigator concludes that social security or pension plans, which some have suggested could substitute for old-age support from sons, may not necessarily reduce son preference, and may therefore have less of an influence on fertility decision-making than has sometimes been assumed.

1. C. Vlassoff, "The Value of Sons in an Indian Village: How Widows See It," *Population Studies*, **44**:5, 1990.

IUD Insertion and Uterine Position

A tilted uterus should be no contraindication for IUD use, according to the results of a multicountry study conducted over 11 years at 23 centers.[1] More than 5,500 parous women who had IUDs inserted were compared to determine whether uterine position affected the frequency of complications or the device's effectiveness. The investigators discovered that there were no statistically significant differences in the incidence of failed IUD insertion or uterine perforation between women with a normal uterus and those in whom the uterus was tilted either backward (retroverted) or forward (anteverted). The only significant difference in insertion-related problems was that women with a retroverted uterus were less likely to have had cervical lacerations than were other women. In addition, at the end of one year, women with a normal uterus were significantly more likely to have had their IUD removed because of bleeding or pain. The researchers speculate that when experienced obstetrician-gynecologists insert an IUD, they can effectively deal with difficult uterine positions "by using measures such as sounding to detect direction and curvature of the uterine lumen and/or [using] the tenaculum to straighten the uterus."

1. I.-C. Chi et al., "Do Retroverted Uteri Adversely Affect Insertions and Performance of IUDs?" *Contraception*, **41**:495, 1990.

Nonsurgical Sterilization in China

A potentially reversible method of male sterilization that does not involve surgery has shown great success in Chinese tests so far: The method, in which a small amount of liquid polyurethane is injected into the vas deferens to form a plug, has been tried by 12,000 men, including 1,000 who have been followed for five years and 2,600 who have been followed for three years.[1] As yet, no accidental pregnancies have resulted, and the incidence of complications (such as local infection or hematoma) has been low. In addition, the researchers believe that if a man wants to have more children, simple removal of the plastic plug will restore fertility. So far, 86 men have asked for the plugs to be removed, and 51 have subsequently impregnated their wives, including all 31 who have had their sterilizations reversed for at least one year. The researchers conclude that the "percutaneous injection of polyurethane elastomer provides a nontraumatic method of vas occlusion with several advantages over surgical vasectomy."

1. Z. Sheng-cai, "Vas Deferens Occlusion by Percutaneous Injection of Polyurethane Elastomer Plugs: Clinical Experience and Reversibility," *Contraception*, **41**:453, 1990.

Note to Authors

International Family Planning Perspectives is a peer-reviewed quarterly journal publishing research articles about the developing world that are intended to be of assistance to professionals in the fields of fertility and family planning, maternal and child health and population policy. The editors invite researchers, policymakers and program operators from around the world to submit articles on such topics as contraceptive practice and research; population growth; fertility levels, trends and determinants; childspacing; public policies and legal issues affecting family planning and childbearing; family planning program operation, development and evaluation; information, education and communication activities; sexually transmitted diseases; and reproductive, maternal and child health. Manuscripts should be sent to the address below, and should include the complete affiliation, address, telephone number and Fax number (if possible) of the author with whom we are to correspond.

Manuscripts may be submitted in English, French or Spanish, and are read with the understanding that they neither are under consideration elsewhere nor have been published previously. All submissions are reviewed by the editorial staff and, if deemed of interest, undergo anonymous peer review. Manuscripts not accepted for publication will not be returned. Upon acceptance, all manuscripts will be edited to the extent necessary to conform to the style of the journal. Authors will have two opportunities to review their article after it has been edited. Authors must assign copyright to the journal.

Selected articles appear on an annual basis in the Spanish edition of the journal, *Perspectivas Internacionales en Planificación Familiar,* and in the French edition, *Perspectives Internationales sur le Planning Familial.*

Manuscripts should be typed double-spaced, with all pages numbered and with a title page that includes the names and affiliations (at the time of the work reported) of all authors. Submissions should run no more than 30–35 pages, with no more than 7–8 tables; only one copy need be sent. Manuscripts should include a summary of up to one page in length.

Each table and chart should be on a separate page. Authors should check previous issues of *International Family Planning Perspectives* to gain an idea of how tables are to be styled. Authors must supply data points for all line graphs and charts; final art work will be done by the journal's staff.

Nota para Autores

International Family Planning Perspectives es una revista trimestral que publica monografías sobre el mundo en desarrollo destinadas a asistir a profesionales en las esferas de fecundidad y planificación familiar, salud maternoinfantil y política de población. Invitamos a investigadores y responsables de políticas y programas de todo el mundo a que presenten artículos sobre temas tales como práctica e investigación en materia de anticonceptivos; crecimiento demográfico; niveles, tendencias y determinantes de la fecundidad; espaciamento de los hijos; políticas oficiales y cuestiones jurídicas que afecten la planificación familiar y la fecundidad; aplicación, elaboración y evaluación de programas de planificación familiar; actividades de información, instrucción y comunicación; enfermedades transmitidas sexualmente y salud reproductiva y maternoinfantil. Los originales deben enviarse a la dirección que figura más abajo, debiendo constar en ellos filiación completa, domicilio postal, teléfono y, de ser posible, numero de Fax del remitente.

Los originales pueden ser en español, francés o inglés. Serán aceptados en la inteligencia de que son inéditos y no están siendo considerados por ninguna otra publicación. El personal de edición examinará todos los trabajos presentados y, de hallarlos interesantes, los hará evaluar por otros especialistas sin divulgar el nombre del autor. No se devolverán los originales rechazados. Los que se acepten serán revisados en la medida necesaria para conformarlos al estilo de la revista. Los autores tendrán dos oportunidades de examinar sus monografías revisadas y deberán ceder los derechos a la revista.

Algunos artículos se seleccionarán para las ediciones anuales española, *Perspectivas Internacionales de Planificación Familiar,* y francesa, *Perspectives Internationales sur le Planning Familial.*

Los originales deberán presentarse dactilografiados a doble espacio. Las páginas deberán ir numeradas, debiendo figurar en la primera nombre y filiación (al momento de escribirse el trabajo) completos de todos los autores. Los artículos no podrán exceder las 35 páginas ni incluir más de ocho cuadros. No hace falta enviar sino un ejemplar. Los originales deberán ir acompañados de un resumen de hasta una página.

Cada tabla o gráfico deberá ir en hoja aparte. Conviene que los autores consulten números anteriores de *International Family Planning Perspectives* para hacerse una idea del respectivo formato. Deberán suministrar también todas las cifras y datos necesarios para cada gráfico o cuadro. La revista se encargara del diseño gráfico.

Note aux auteurs

La revue trimestrielle *International Family Planning Perspectives* publie des articles présentant des résultats de recherche sur les pays en développement et destinés à éclairer les spécialistes de la fécondité, de la planification familiale ainsi que de la santé maternelle et infantile et des politiques démographiques. La rédaction invite tout chercheur, dirigeant ou administrateur de programme du monde entier à soumettre des articles sur les sujets suivants: pratique contraceptive et recherche dans le domaine de la contraception; croissance démographique; niveaux, tendances et facteurs déterminants de la fécondité; espacement des naissances; questions juridiques et d'ordre public influant sur la planification familiale et la procréation; administration, élaboration et évaluation de programmes de planification familiale; activités relatives à l'information, l'éducation et la communication; maladies sexuellement transmissibles; hygiène sexuelle et comportement reproducteur; et santé maternelle et infantile.

Les auteurs doivent adresser les manuscrits à l'adresse ci-dessous et mentionner les références complètes, adresse, numéro de téléphone et numéro de télécopieur (si possible) de la personne avec qui nous devons communiquer. Les manuscrits peuvent être rédigé en anglais, en français ou en espagnol et ne seront acceptés qu'à la condition qu'ils n'aient été soumis à aucune autre publication, ni déjà publiés. Tous les articles sont édités par la rédaction et s'ils sont jugés intéressants, présenté, à titre anonyme, à l'appréciation de spécialistes. Les manuscrits non publiés ne seront pas renvoyés à leur(s) auteur(s). Une fois acceptés, les manuscrits seront éventuellement édités afin de les adapter au style et présentation propres à la revue. Les auteurs auront ensuite, à deux reprises, l'occasion de revoir leur article. Ils devront céder les droits d'auteur à la revue.

Certains articles retenus sont également publiés dans les éditions annuelles de la revue, en espagnol, *Perspectivas Internacionales en Planificación Familiar* et en français, *Perspectives Internationales sur le Planning Familial.*

Tous les manuscrits doivent être préparés de la manière suivante: Ils doivent être dactylographiés en double interligne, avec un maximum de 30–35 pages et chaque feuillet doit être soigneusement paginé.

La première page doit fournir les noms de tous les auteurs ainsi que leurs références (au moment où travaux ou recherches ont été effectués). Ils ne doivent pas comporter plus de 7–8 tableaux et doivent inclure un résumé ne dépassant pas une page. L'auteur ne doit soumettre qu'un seul exemplaire.

Tableaux et graphiques devront figurer chacun sur un feuillet séparé. Les auteurs sont priés de consulter les numéros précédents de la revue afin de voir comment les tableaux doivent être présentés. Ils devront également fournir les points de données pour tous diagrammes et graphiques.

Olivia Schieffelin Nordberg
Editor-in-Chief
International Family Planning Perspectives
The Alan Guttmacher Institute
111 Fifth Avenue
New York, NY 10003
USA

Scholastic and Personality Characteristics Of Only Children and Children with Siblings in China

"Our study offers no support for the belief that Chinese only children are 'little emperors.' Overall, we found few differences in virtue and competence between children who had siblings and those who did not."

By Dudley L. Poston, Jr., and Toni Falbo

Summary

A study of the effects of being an only child on academic achievement and personality characteristics was undertaken in 1987 among Chinese schoolchildren in Changchun, Jilin Province. The findings did not support reports in the Chinese and Western press that China's one-child-per-family policy is creating a generation of spoiled children. Overall, the only children performed significantly better than children with siblings on academic measures but scored similarly on personality ratings. When the children were subdivided by urban vs. rural residence and by grade level, urban children without siblings scored significantly higher than their peers with siblings on academic measures; there were no differences on these measures among the rural children. Although the children's teachers tended to rate the only children as more virtuous and more competent than the children with siblings, the parents' ratings of their own children on the same scales indicated no significant differences between the two groups.

Introduction

For well over a decade, the People's Republic of China has viewed population control as fundamental to the realization of the "four modernizations" of agriculture, industry, defense, and science and technology. In 1979, China established the "one-child" policy, which is expressed in the official slogan "one child is best, at most two, never a third."[1] The policy is strictly enforced only in urban areas, however; considerably more leniency is permitted in the vast rural areas where more than 70 percent of the population lives.[2] By limiting growth so that China's population does not exceed 1.2 billion by the end of the century, the nation's leaders hope to stimulate economic development and substantially improve the standard of living.[3] To date, the one-child policy appears to have been very successful in urban areas: Reports indicate that in recent years, first births have made up 98 percent of all births in Shanghai, 90 percent of those in Tianjin and 86 percent of those in Beijing.[4] However, according to other sources, "there has been much less than full compliance with the official one-child policy."[5]

Recent reports from China have suggested that the one-child-per-family policy may be producing a generation of "little emperors" (the Chinese equivalent of spoiled brats). Many Chinese are expressing the fear that in the years ahead China may very well have millions of spoiled and maladjusted only children who do not possess the virtues that Chinese culture values so highly. In December 1987, for example, *Time* magazine reported that there "may be hundreds of thousands, perhaps millions, of . . . [these little emperors] throughout China . . . [and] the reason [is] Beijing's stringent one-child-per-couple policy. . . . [These millions of little emperors] have been swaddled in the love of their parents and grandparents; as a result, many Chinese fear they are growing up spoiled, selfish and lazy."[6] Indeed, despite the policy's marked demographic and family planning successes, its purported negative effects on the children of China have been so widely reported that they have become familiar to layperson and scholar alike, both in China and in the West. Yet, to date, this issue has not been systematically examined, chiefly because of a lack of sufficiently detailed data on the scholastic performance and personality characteristics of Chinese schoolchildren.

Studies in Western countries have found that only children do not differ significantly from children with siblings in adjustment, sociability or other personality characteristics.[7] However, only children tend to outperform children with siblings on various measures of scholastic performance, particularly when they are compared with last-born children or children with four or more siblings.

A recent review of the Chinese literature on only children published between 1980 and the first part of 1988 provides a picture that is not entirely clear.[8] Some articles report that only children are deficient, particularly in moral character; others indicate that they differ little from other children. Still other studies note that only children surpass children with siblings in academic performance.

There are at least three reasons for these mixed results. First, each study used unique methodological approaches; for example, several studies analyzed moral development, but no two studies measured it in the same way. Second, the size of the samples was usually quite small, ranging from about 30 to 100 children. Third, many of the studies simply compared the characteristics of only children with those of children with siblings, and did not consider relevant background characteristics such as the parent-child relationship and the socioeconomic level, structure and size of the family. In addition, most of the previous research was conducted in urban areas of Beijing, Shanghai and Tianjin, so differences resulting from urban vs. rural residence could not be addressed.

In this article, we examine the accuracy of assertions in the media that Chinese only children are spoiled, selfish, lazy and maladjusted. If these assertions are true, being an only child should be negatively associated with virtue and competence and with academic performance. We have tried

---

Dudley L. Poston, Jr., is professor and chair of the Department of Rural Sociology, Cornell University. Toni Falbo is professor in the Educational Psychology and Sociology departments, University of Texas at Austin. This article is adapted from a presentation at the annual meeting of the Population Association of America, Baltimore, Md., April 1989; the authors thank Judith Bannister for comments on an earlier draft.

to improve on the available literature on only children in three ways. First, we selected a large, heterogeneous sample, including children from both urban and rural areas. Second, we used regression procedures that allowed us to consider relevant background variables while comparing only children with children with siblings. Third, our sample was drawn from a relatively understudied population: schoolchildren living in Changchun, the capital of Jilin Province. Changchun, one of northeastern China's three leading industrial cities,[9] also includes extensive farmlands.*

Methodology

Our investigation was undertaken in collaboration with demographers and sociologists from the Population Research Institute of Jilin University. After reviewing the results of a pilot survey of 165 children conducted in December 1986 and January 1987, we revised the survey instruments and proceeded with the full survey of 1,465 schoolchildren in June and July of 1987. Eight schools took part in the study, five in the urban part of Changchun (78 percent of the students), and three in the rural part (22 percent of the students). Because we wanted to survey students born before 1979, the year when the one-child policy was initiated, as well as those born after the policy was in place, we sampled fifth graders (46 percent of the sample) and first graders (54 percent).

The survey questionnaire asked for a variety of information: Each child's teacher provided the child's scores on mathematics and Chinese language examinations and rated the child on a checklist of 31 personality attributes. The child's mother (or father) provided detailed background information on family size; the education, job and earnings of each parent; the long-range expectations of each parent for the child; and how often each parent helped the child with schoolwork. The mother or father also completed the checklist of personality attributes.

Table 1. Checklist of 31 personality attributes and their polar opposites

	Attributes	Polar opposites
1.	Is competitive	Is not competitive
2.	Is rough	Is gentle
3.	Does not cry easily	Cries very easily
4.	Gives up easily	Does not give up easily
5.	Is not easily hurt	Is easily hurt
6.	Does not let others know how he/she feels	Lets others know how he/she feels
7.	Is concerned about being liked	Is not concerned about being liked
8.	Can't make decisions easily	Can make decisions easily
9.	Is selfless	Is selfish
10.	Does not care about others' feelings	Cares about others' feelings
11.	Has definite views	Has no definite views
12.	Is incompetent	Is competent
13.	Is kind	Is cruel
14.	Always needs adult help	Never needs adult help
15.	Is always certain he/she can do what he/she tries to do	Is never certain he/she can do what he/she tries to do
16.	Is never helpful to others	Is always helpful to others
17.	Always acts as a leader	Never acts as a leader
18.	Is always willful	Is never willful
19.	Is timid	Is brave
20.	Respects property	Does not respect property
21.	Is never aggressive to others	Is aggressive to others
22.	Respects elders	Does not respect elders
23.	Is not fascinated with fancy dress	Is fascinated with fancy dress
24.	Does not like to take part in manual labor	Likes to take part in manual labor
25.	Is modest	Is not modest
26.	Always lies	Never lies
27.	Likes to join in collective activity	Does not like to join in collective activity
28.	Does not pay attention in class	Pays attention in class
29.	Likes to answer questions	Does not like to answer questions
30.	Copies homework of others	Does not copy homework of others
31.	Shares belongings with others	Does not share belongings with others

The checklist shown in Table 1 is an instrument we developed to gauge the degree to which Chinese schoolchildren have personality attributes deemed desirable in their culture; some of the attributes had been used in earlier Chinese studies that compared only children with children with siblings.[10] We added others to the instrument on the basis of recommendations from, and tests conducted with, Chinese students pursuing social science graduate degrees in the United States. The checklist presented each attribute in terms of polar opposites.† For example, the teacher or parent was asked to check whether the child was selfish or selfless, and respectful or disrespectful to elders.

To evaluate the degree of reliability of the checklist ratings, we performed three separate statistical analyses of the data. First, we compared the ratings of the parents and the teachers to determine their degree of similarity. We reasoned that some degree of consensus should exist between these two sets of ratings, although we also felt that there should be only a partial overlap between them because the observations of parents and teachers usually occur in different contexts. We found that the ratings given by the parents were quite similar to those given by the teachers.

Second, we considered that if the checklist assessed something about the child that was stable and consistent over time, then the two sets of ratings of the same child made at different times would be related. By comparing the data from the pretest with data from the actual survey (which was conducted seven months later), we were able to identify 51 cases in which the same teacher evaluated the same student at two points in time. All but one of these

---

*The spatial definitions of Chinese cities, unlike those of cities in the West, include both the cities themselves and the surrounding suburban and rural areas. In 1985, Changchun had an urban population of 1.8 million residing in an area of 1,116 square kilometers; the city's suburban counties had a population of about four million living in an area of 17,765 square kilometers (see: State Statistical Bureau, *City Statistical Yearbook of China: 1985*, Statistics Press, Beijing, 1985).

†According to many Chinese scholars, most Chinese respondents prefer to use checklists rather than rating scales when evaluating personality characteristics. When we pretested many of the items on the checklist in Beijing in 1985, we asked the teachers to indicate where each child was located along a continuum connecting two polar attributes. Most had difficulty making gradations of judgments about the attributes of each child; most simply checked one or the other polar attribute.

test-retest correlations were statistically significant, with an average correlation of about 0.43.

Third, we used factor analysis to determine the degree of similarity between the rating patterns generated by the teachers and by the parents. Here, we reasoned that if the factor analyses produced similar underlying dimensions or traits, this would suggest that the two groups of adults were basing their ratings of the children on similar concepts. The two factor analyses produced very similar structures with two main dimensions; we have labeled these "virtue" and "competence." The personality attributes used to define these factors are shown in Table 2.

We then used the factor analysis results to construct two sets of scales, one each for the teachers and the parents, which we use here as indicators of the personality traits of the children. We totaled the actual scores of the 15 attributes that defined virtue (see Table 2), as specified by the teachers, to form a scale; a second virtue scale using the attributes specified by the parents was created in a similar manner. The range of values on each virtue scale was 1–15. The same method was used to construct parent and teacher scales for competence. These two scales ranged in value from zero to nine. For both samples, the alpha coefficient for each scale was at least 0.80, indicating a high degree of inter-item consistency. Also, the two sets of virtue and competence scale scores were positively and significantly correlated in both samples, indicating that both scales measure personality aspects considered desirable in China.

Results

To determine whether sibling status has a significant effect on a child's performance on examinations in mathematics and Chinese language and on teacher and parent evaluations of a child's virtue and competence, we first compared the mean scores of only children and children with siblings on each of these outcomes. We then performed a separate regression analysis for each of the outcomes using selected independent variables, including sibling status.

The first two rows of data in Table 3 present mean scores of all the only children and all the children with siblings on each scholastic achievement and personality variable. Overall, the only children performed significantly better than children with siblings on mathematics tests and Chinese language examinations. However, there were fewer differences between only children and children with siblings on the personality variables. The only children were evaluated by their teachers as significantly more virtuous and competent than were the children with siblings, but according to the evaluations given by the parents, the only children and the children with siblings were not significantly different from each other in virtue and competence.

The next four sets of data in the table show the mean scores for only children and children with siblings on the six scholastic achievement and personality outcomes by rural vs. urban residence and by grade level. When residence and grade level were controlled, the differences between the mathematics and language scores of the only children and those of the children with siblings were significant only among the urban children. In the rural areas of Changchun, only children and children with siblings did not differ significantly in scholastic achievement.

When residence and grade level were controlled, the only children and the children with siblings varied significantly on only one personality outcome. Teachers evaluating urban first graders rated those who were only children as significantly more virtuous than those with siblings. There were no other statistically significant differences by sibling status in any of the residence or grade-level subgroups. According to our findings, in each of those subgroups the only children and the children with siblings were much more similar than they were different.

Table 2. Personality attributes that define virtue and competence

Virtue	Competence
Is gentle (2)	Is competitive (1)
Is concerned about being liked (7)	Does not give up easily (4)
Is selfless (9)	Can make decisions easily (8)
Cares about others' feelings (10)	Has definite views (11)
Is kind (13)	Is competent (12)
Is helpful (16)	Is confident (15)
Is never willful (18)	Acts as a leader (17)
Respects property (20)	Is brave (19)
Is never aggressive (21)	Answers questions actively (29)
Respects elders (22)	
Is modest (25)	
Never lies (26)	
Pays attention in class (28)	
Does not copy homework (30)	
Shares belongings (31)	

Note: Numbers following each item refer to personality attributes on the checklist in Table 1.

Next, we evaluated the degree to which being an only child is associated with each of the six scholastic achievement and personality outcomes. For each outcome, we performed a regression analysis to examine the effects of five independent variables in addition to sibling status that could have an effect on one or more of the scholastic and personality measures. Those five variables were the sex of the child, paren-

Table 3. Mean scores of only children and children with siblings on six scholastic and personality outcomes, by residence and grade level, Changchun, China, 1987

Residence and grade	N	Achievement		Virtue rating		Competence rating	
		Math	Chinese	Teacher	Parent	Teacher	Parent
All	1,458†						
Only child	492	92.6	93.2	12.2	11.8	5.1	5.6
A sibling	966	83.1**	84.9**	11.7**	12.0	4.7*	5.7
Urban							
First grade							
Only child	364	95.6	97.1	12.4	11.8	5.2	5.6
A sibling	199	93.3**	95.5**	11.9*	11.7	4.6	5.9
Fifth grade							
Only child	72	86.2	86.3	11.8	11.7	4.7	5.3
A sibling	415	82.1*	86.2	11.8	12.2	4.7	5.8
Rural							
First grade							
Only child	46	80.1	75.3	11.2	11.6	5.3	5.8
A sibling	173	81.3	77.6	10.6	11.5	4.6	5.6
Fifth grade							
Only child	5	80.4	82.4	11.6	12.2	5.0	6.6
A sibling	175	75.9	76.9	12.2	12.3	5.1	5.6

*Difference in means between children with siblings and only children significant at $p<0.05$.

**Difference in means between children with siblings and only children significant at $p<0.01$.

†The Ns for urban and rural children add to 1,449 because nine children did not indicate residence or grade.

Table 4. Unstandardized regression coefficients for six scholastic and personality measures, by selected background characteristics

Characteristics	Achievement		Virtue rating		Competence rating	
	Math (N=1,358)	Chinese (N=1,358)	Teacher (N=1,361)	Parent (N=1,360)	Teacher (N=1,361)	Parent (N=1,360)
Only child†	1.77*	0.86	0.55*	0.03	0.44**	–0.26
Parental education‡	1.31**	1.05**	–0.00	–0.07	0.11**	0.00
Sex of child§	2.10**	2.84**	1.77**	1.02**	0.43**	0.32**
Parental help ††	0.24	0.36	0.06	0.08	0.00	0.01
Parental expectations‡‡	0.62**	0.85**	0.09*	0.08*	0.12**	0.23**
Nuclear family§§	0.05	–0.12	–0.17	–0.04	0.29	0.10
Residence*†	–6.04**	–11.07**	–0.50*	–0.23	0.55**	–0.16
Grade*‡	–8.88**	–6.89**	0.31	0.41**	0.10	–0.12
Constant	99.26	104.93	11.09	11.33	3.41	5.91
Adj. R^2	0.313	0.361	0.107	0.050	0.025	0.035

*Coefficient significant at $p<0.05$. **Coefficient significant at $p<0.01$.

†A sibling=0; only child=1. ‡Combined score, range 2–13 §Male=1; female=2.

††Combined range from 2 (neither parent ever helps) to 6 (both parents always help).

‡‡Combined range from 2 (neither parent has any expectations for child) to 8 (both parents expect child to be someone very important).

§§No=0; yes=1 *†Urban=1; rural=2. *‡First grade=1; fifth grade=2.

tal education, parental help with homework, parental expectations for the child and whether the child lived in a nuclear family. The two control variables were child's residence and child's grade in school.

Multiple regression analysis indicated that performance on mathematics examinations is positively associated with being an only child, net of the effects of the other independent and control variables. Being an only child is also significantly associated with teachers' evaluations of virtue and competence: Only children tended to receive higher scores from their teachers on these personality dimensions than did children with siblings. The results shown in Table 4 in no way support the notion that only children in China are spoiled and selfish, lack virtue and are poor students.

If sibling status is not a consistent predictor of Chinese schoolchildren's scholastic and personality outcomes, what does predict how well a child will do? Although a full answer to this question is beyond the scope of this article, our findings do provide some indications. The results in Tables 3 and 4 show that the urban schoolchildren performed better than the rural schoolchildren on scholastic examinations. Table 4 also indicates that girls scored higher than boys on both scholastic achievement tests and personality evaluations. Moreover, parental education is positively associated with the child's performance on both Chinese and mathematics examinations. Finally, the greater the parental expectations for the child's future, the higher the child's performance.

Conclusion

Our study offers no support for the belief that Chinese only children are little emperors. Overall, we found few differences in virtue and competence between children who had siblings and those who did not. When statistically significant differences were found, they tended to indicate that only children had more positive outcomes than children with siblings. For example, our results indicate that only children in urban areas tend to outperform their peers with siblings on both mathematics tests and Chinese language examinations. The results of this study are in many ways similar to those of Western studies that examined the effects of sibling status.

Fears about Chinese children who lack siblings may be based on the assumption that Chinese children spend most of their preschool years alone with their mothers, without the give-and-take of sibling companionship. However, most of the children in the Changchun sample had spent an overwhelming part of their preschool years—six days a week for more than eight hours a day—in group care, in direct interaction with their peers. The parents of these only children appear, therefore, to have had little opportunity to spoil them. Nevertheless, these results are from only one region in one province of China and cannot be generalized to the country as a whole. Additional investigations of the effects of sibling status are needed, especially in the vast rural areas of the country where so many Chinese people live.

References

1. "Population," *China News Analysis*, No. 1163, Sept. 14, 1979, p. 5.

2. H. Y. Tien, "Second Thoughts on the Second Child: A Talk with Peng Peiyun," *Population Today*, Vol. 17, No. 4, Apr. 1989, p. 6.

3. J. Banister, *China's Changing Population*, Stanford University Press, Stanford, Calif., 1987.

4. B. Gu, D. L. Poston, Jr., and J. Shu, *The People's Republic of China Population Data Sheet*, The University of Texas Printing Division, Austin, 1987.

5. M. K. Whyte and S. Z. Gu, "Popular Response to China's Fertility Transition," *Population and Development Review*, **13**:471, 1987.

6. H. G. Chua-Eoan, "Bringing up Baby, One by One: A Single-Child Policy Delivers Millions of Tiny Tantrums," *Time*, Dec. 7, 1987.

7. T. Falbo and D. F. Polit, "A Quantitative Review of the Only Child Literature: Research Evidence and Theory Development," *Psychological Bulletin*, **100**:176, 1986; D. F. Polit and T. Falbo, "Only Children and Personality Development: A Quantitative Review," *Journal of Marriage and the Family*, **49**:309. 1987; ——, "The Intellectual Outcomes of Only Children," *Journal of Biosocial Science*, **20**:275, 1988; J. Blake, "The Only Child in America: Prejudice Versus Performance," *Population and Development Review*, **7**:43, 1981; and ——, *Family Size and Achievement*, University of California Press, Berkeley, 1989.

8. X. Feng, "An Analysis of Only Children in China," *Jianghai Journal*, **1**:4, 1990.

9. D. L. Poston, Jr., "The Urban Hierarchy of Dongbei," *Proceedings of the International Conference on Urbanization and Urban Population Problems (ICUUPP)*, Organizing Committee of the ICUUPP, Tianjin, 1987, p. 480; and D. L. Poston, Jr., and B. Gu, "The Giant Cities of China: Patterns of Dominance and Integration," in B. Hamm, ed., *Progress in Human Ecology*, Mittal Publications, New Delhi, India, 1990, forthcoming.

10. C. C. Ching, "The One-Child Family in China: The Need for Psychosocial Research," *Studies in Family Planning*, **13**:208, 1982; D. L. Poston, Jr., and M. Yu, "Quality of Life, Intellectual Development, and Behavioural Characteristics of Single Children in China: Evidence from a 1980 Survey in Changsha, Hunan Province," *Journal of Biosocial Science*, **17**:127, 1985; and T. Falbo et al., "Only Children in China," Texas Population Research Center Papers, No. 8,023, The University of Texas at Austin, Population Research Center, Austin, 1986.

Resumen

En 1987 se realizó un estudio de los efectos de ser hijo único sobre los logros educacionales y la formación de la personalidad entre escolares chinos en Changchun, Provincia de Jilin. Las conclusiones no corroboraron los resultados publicados en la prensa china y occidental de que la política de China de limitar las familias a un solo hijo está creando una generación de niños consentidos. En términos generales, el desempeño escolar de hijos únicos era considerablemente superior a el de los hijos con hermanos, pero en cuestiones de personalidad, los resultados fueron similares. Cuando se subdividió a los niños de acuerdo con su residencia, urbana o rural, y por nivel educacional los

(Continued on page 54)

Initial Acceptability of Contraceptive Implants in Four Developing Countries

In Bangladesh and Nepal, women with no education were more interested in trying NORPLANT contraceptive implants than were women with some education, while in Haiti, women with the most education were most interested in NORPLANT.

By Thomas T. Kane, Gaston Farr and Barbara Janowitz

Summary

An analysis of 2,586 potential acceptors of hormonal contraceptive implants (NORPLANT®) interviewed at 10 family planning clinics in Bangladesh, Haiti, Nepal and Nigeria reveals that interest in trying NORPLANT is high: Between 48 percent and 67 percent of respondents who had come to the clinics to start contraception or to obtain information about NORPLANT and were considered potential implant acceptors expressed an interest in trying the method. Large proportions of women identified effectiveness, reversibility and convenience as the implants' most attractive aspects. Women in their late 20s or older who had had a few children and were interested in spacing births for at least several years or in limiting births, but were not ready for sterilization, were most likely to express interest in NORPLANT. The findings also point out the need for thorough counseling to reduce the apprehensions that women and their husbands may have about the method, such as fear of side effects or of the insertion or removal procedure.

Introduction

The continuing search for more convenient, effective and culturally acceptable methods of contraception has led to the development in recent years of a series of long-acting steroidal contraceptive methods. One of these is the subdermal hormonal implant system called NORPLANT, which is in the early phases of introduction in a number of developing countries. NORPLANT is a low-dose, progestin-only contraceptive tested in clinical or preintroduction trials involving over 55,000 women in 44 countries. As of January 1990, it had also been approved for programmatic use in at least 14 countries, where over 400,000 more women have used it.

NORPLANT works by allowing the steady release of low levels of levonorgestrel from six capsules implanted beneath the skin of the user's upper arm. Only a small incision is needed to insert or remove the implant. Within 24 hours of its placement in the arm, NORPLANT is releasing levonorgestrel at levels high enough to prevent pregnancy, and it continues to do so for more than five years. In the majority of menstrual cycles, the circulating level of levonorgestrel prevents ovulation; in the relatively rare cycles in which ovulation does occur, however, the implant prevents pregnancy by thickening the cervical mucus (and thus impeding sperm penetration) and by suppressing endometrial development. Users usually begin to ovulate and become capable of conceiving shortly after the capsules have been removed.[1]

During the past decade, an increasing body of research has focused on the introduction and acceptability of new contraceptive methods in various countries. A major objective of such research is to provide feedback to family planning program managers and biomedical researchers, to enable them to modify programs and technology accordingly.[2] Although preintroductory clinical trials have examined continuation rates and user satisfaction, questions remain about the potential popularity of the method among contraceptive users.

The success of any new method depends to a large extent on its acceptability. A user's initial reactions to a method will depend, in part, on what information the individual has received about the method and how that information has been presented. Numerous factors may affect a woman's interest in and decision to adopt a new method such as NORPLANT: These include the method's side effects, insertion and removal procedures, effectiveness, reversibility and contraindications, the woman's desire for more children, concerns about her fertility following use and correct knowledge of how the method works and her husband's attitude toward the method, as well as rumors about the method and religious considerations.

A previous publication has outlined the

Thomas T. Kane is Rockefeller research fellow at the Centre d'Etudes et de Recherche sur la Population pour le Développement, Institut du Sahel, Bamako, Mali; Gaston Farr is research associate in the Clinical Trials Division and Barbara Janowitz is evaluation specialist in the office of the president, Family Health International (FHI), Research Triangle Park, N.C. The authors wish to thank all the investigators at the participating NORPLANT clinical trial study centers who helped to ensure that the NORPLANT Acceptability Surveys were properly administered: *Bangladesh*— S. Firoza Begum, Dhaka Medical College, Dhaka; T. A. Chowdhury, Institute of Post Graduate Medicine and Research, Dhaka; Sabem Rahman, Mohammadpur Fertility Services Training Center, Dhaka; *Haiti*—Régi-nald Boulos, the Haitian Arab Center (Complexe Médico-Social de la Cité Soleil), Port-au-Prince; Guy Théodore, Hôpital de Bienfaisance, Pignon; Dr. Fritz Lolagne, Salvation Army Clinic, Fond des Nègres; *Nepal*—Mahendra Chhetri and Hasta Lama, Lalitpur clinic, Patan; Swaraj Rajbhandari and S. K. Rai, The Family Planning Association of Nepal clinic in Kathmandu; *Nigeria*—O. A. Ladipo, University College Hospital, Ibadan; C. C. Ekwempu, Ahmadu Bello University Hospital, Zaria; Olurotimi Fakeye, University Hospital, Ilorin; Eugene Okpere, University of Benin Teaching Hospital, Benin City; and Joseph Otubu, University of Jos Teaching Hospital, Jos. Special appreciation and thanks are also extended to Sandor Balogh and Susan Klavon, Clinical Trials Division, FHI, for their helpful advice and assistance in the various stages of the study. We also would like to thank Peter Lamptey, Kathy Jesencky, Lynne Wilkens, Gary Grubb, James McMahan and Douglas Nichols for their efforts in monitoring the progress of the NORPLANT Acceptability Surveys at the various study centers and for reviewing an early draft of this article. Malcolm Potts, Nancy Williamson, Karen Hardee-Cleaveland, Shyam Thapa, Elizabeth Hervey Stephen and several anonymous reviewers evaluated drafts of this article and provided valuable comments.

Financial support for the study on which this article is based was provided by the U.S. Agency for International Development (AID), but the views expressed by the authors do not necessarily reflect those of AID.

various types of attitudinal and behavioral studies of contraceptive acceptability and the value and limitations of each methodological approach.[3] To date, most studies of NORPLANT's acceptability have focused on acceptors' characteristics, attitudes, perceptions and degree of satisfaction, and on their rate of continuation or discontinuation.[4] However, with the exception of the clinic-based surveys reported in this article, very little has been done to look at the interest in or potential demand for NORPLANT among users most likely to be considering a new method—women seeking family planning services. Research on NORPLANT so far has generally failed to examine the earliest stage of contraceptive adoption—initial acceptability. This stage includes the family planning client's first exposure to information about the method, her subsequent interest or lack of interest in it and her decision whether or not to use it.

Our study attempts to determine the level of interest in trying NORPLANT among women visiting family planning clinics in Bangladesh, Haiti, Nepal and Nigeria. The objectives of the surveys that we conducted were to determine the impact of social and demographic factors on interest in contraceptive implants, to discover what women interested in the method liked about it and to learn what women not interested in the method disliked about it. Such findings may help family planning program administrators and service providers identify potential NORPLANT acceptors, as well as enable providers to develop programs that can help overcome some of the obstacles to acceptance.

Methodology

As part of the recruitment for NORPLANT preintroductory clinical trials in 1985 and 1986, NORPLANT Acceptability Surveys were conducted at 13 family planning clinics in Bangladesh, Haiti, Nepal and Nigeria. An effort was made to ensure that the questionnaires were as uniform as possible at all sites while at the same time meeting the needs of each participating clinic. All nonsterilized women of reproductive age visiting the clinic for any contraceptive or health-related reason were eligible for interview.* Respondents were asked about several background characteristics: their age, education, desired family size, current and past contraceptive experience, breastfeeding status, access to family planning services and previous knowledge of NORPLANT, as well as the source of any such information. Centers in Nigeria and Haiti also collected information on the respondents' religion, literacy and willingness to pay for the implants.

As part of the interview, respondents were read a fact sheet that included information on how NORPLANT works, its effectiveness, its possible side effects and how it is inserted and removed. No special fact sheet was provided for other contraceptive methods offered at these clinics (e.g., the pill, condom, IUD, injectables, and male and female sterilization), but normal informational materials and counseling were available. The same fact sheet was read to all women interviewed in each country. Afterwards, each woman was asked if she would be interested in using the contraceptive implant and what additional information she would like to have. She was then asked an open-ended question on her reasons for wanting or not wanting to use the method. The respondent was also asked to indicate which of a number of preselected reasons were important in her decision. (These responses had been identified during pretests of the survey instrument and were based on responses to an open-ended question on reasons for wanting or not wanting to try NORPLANT.)

Although the circumstances and services provided varied somewhat from clinic to clinic, the sites participating in the survey were primarily full-service family planning clinics; most provided oral contraceptives, condoms, IUDs and female sterilization procedures, and at least some offered injectables and male sterilization. (Some also provided maternal and child health services.)

Fieldwork began at the first two clinics in February 1985 and was completed at all sites by July 1986. For reasons of cost and logistics, the total number of interviews at each clinic was not to exceed five times the number of NORPLANT acceptors who were enrolled in the clinical trials being organized at each facility. Interviews were carried out only during the recruitment period for the clinical trials, and were conducted upon a woman's arrival at the clinic. The questionnaires were administered by trained social workers and interviewers at all sites except for one in Nepal, where the interviews were also conducted by motivators or health workers at satellite clinics in surrounding communities where participants in the NORPLANT trials were being recruited.

For this comparative analysis, data were pooled after we excluded three of the 13 participating centers because of data collection problems: one Nigerian center, because questionnaires were completed almost solely for NORPLANT acceptors; one in Bangladesh, because apparently only women eligible to receive the method (according to the clinical trial criteria) were interviewed; and one in Haiti, because the majority of acceptors were not interviewed. Thus, the sample consisted of women who had visited two clinics in Bangladesh, two clinics in Haiti, two clinics in Nepal and four clinics in Nigeria.

Our original intention was to interview a random sample of women coming to each of the clinics for family planning services. However, in practice, each center ended up interviewing a very different subgroup of women. Undoubtedly, crowded conditions caused the clinics to simplify their procedures for carrying out the interviews. To increase the comparability of the samples, we confined the analysis to the subgroup of women most likely to be interested in NORPLANT. These "potential acceptors" are women coming to the facility to start contraceptive use, to switch methods or to obtain information specifically about NORPLANT. Women who were seeking sterilization are included as potential acceptors. However, we excluded women coming for contraceptive resupply or for maternal health care, and those bringing a child for a health care visit. The subgroup of potential acceptors varied in relative size from clinic to clinic, but confining the analysis to this group increases the comparability of the women across study centers.

Although all NORPLANT acceptors should have been interviewed before they began using the method, a few were not included or recorded as such in the survey, either because the specified sample size of respondents was reached before the target number of clinical trial participants was achieved or because information on some women who began using the method after completion of the interview was not noted on the questionnaire.

Of the 5,039 survey respondents, 2,586 potential acceptors were identified and included in this analysis; 973 of these actually began using the implants. Overall, more than 90 percent of the women who ended up participating in the clinical trials at these 10 centers had been identified through the surveys as potential acceptors. Thus, our definition of a potential acceptor identified the vast majority of women interested in using contraceptive implants.

---

*To be part of the clinical trials, women had to be aged 18–40, sexually active, not currently pregnant and readily accessible for follow-up; they could not have liver disease, jaundice, sickle-cell anemia, herpes gestationis, pelvic inflammatory disease, cancer, thromboembolic disease or hypertension; they must have had at least one pregnancy and must not have used injectable contraceptives in the previous six months. Additionally, in Haiti and Nigeria, women could not be exclusively breastfeeding a child, while in Bangladesh and Nepal, they could not be breastfeeding at all.

Results

Table 1 reveals some variations in the social and demographic characteristics of potential NORPLANT acceptors. On average, those in the Nigerian sample were about 3–5 years older, had almost two more living children, had had around twice as many years of schooling and were much more likely to want additional children than potential acceptors in Bangladesh, Haiti and Nepal. About one-fourth of women in Bangladesh and Nigeria and almost half of those in Haiti and Nepal reported that they were currently breastfeeding their youngest child.

Between 57 percent and 66 percent of the women in Bangladesh, Nepal and Nigeria had come to the clinic to start contraceptive use, compared with 85 percent of those in Haiti. The proportion whose main reason for coming to the clinic was to get information on NORPLANT ranged from less than one percent in Nigeria to 18 percent in Bangladesh. Some 32–37 percent of the women in Bangladesh, Nepal and Nigeria were practicing contraception, compared with only seven percent in Haiti.

The social and demographic composition of the four samples may be very different from that of the general population of women in union. For example, compared with women interviewed in the 1985 Bangladesh Demographic and Health Survey,[5] women in this study were younger, better educated, more likely to have no children or one child and less likely to have four or more children. Variations may also have been caused by differences in the type of women who visit family planning clinics compared with the general population. Morever, women who go to such facilities may not represent all women seeking family planning services, because of such factors as the location of the clinic (e.g., in an affluent district or urban slum area) or the services it provides.

About half of potential acceptors in Bangladesh and Nepal (52–53 percent) had heard about NORPLANT before the interview, compared with almost 60 percent in Nigeria and only 40 percent in Haiti. In the last two countries, the women were also asked how long before their visit they had heard of the method. More than half of the Nigerian women who said they had heard about it previously reported having first heard about NORPLANT on the same day as the interview, while virtually none (one percent) of the Haitian women gave this response. In contrast, only 21 percent of potential acceptors in Nigeria said they had heard about it more than two weeks before the interview, compared with 29 percent of Haitian women.*

Table 1. Means and percentage distributions of background characteristics of potential NORPLANT acceptors, by country

Characteristic	Bangladesh (N=821)	Haiti (N=411)	Nepal (N=814)	Nigeria (N=540)
MEANS				
Age	26.3	27.9	27.4	30.9
No. of living children	3.0	3.2	2.7	4.6
Education (in yrs.)	3.6	2.6	2.6	6.9
Age of youngest child	2.4	1.[illegible]	2.0	1.4
No.of additional children wanted				
All women	0.5	0.6	0.4	1.4
Women wanting more children	1.2	1.3	1.2	2.2
% DISTRIBUTION				
Age-group				
<25	31.5	29.8	35.4	10.9
25–29	41.5	35.4	29.8	27.8
30–34	19.4	20.4	19.5	30.9
≥35	7.6	14.4	15.3	30.4
No. of living children				
0–1	15.8	14.1	16.5	7.4
2	29.2	26.5	37.3	7.6
3	24.5	22.1	24.6	13.6
4–5	23.8	26.8	17.4	35.3
≥6	6.7	10.2	4.2	36.1
Education (yrs.)				
0	46.8	43.1	70.0	23.8
1–7	31.2	49.9	10.7	38.1
≥8	22.0	7.0	19.3	38.1
Age of youngest child				
<1	18.9	35.3	28.6	35.2
1	24.8	30.9	24.1	30.0
≥2	56.3	33.8	47.3	34.8
Breastfeeding status				
Yes	23.0	46.6	44.4	27.6
No	77.0	53.4	55.6	72.4
Desire for more children				
Wants no more	61.2	51.2	63.0	35.6
Wants more				
After 5 yrs.	31.8	36.8	6.3	18.1
Within 5 yrs.	7.0	12.0	30.7	46.3
Additional children wanted				
0	61.2	51.2	63.0	35.6
1	29.5	34.6	30.8	19.6
≥2	9.3	14.2	6.2	44.8
Main purpose of clinic visit				
Start use	58.2	84.9	56.8	65.7
Switch methods	24.2	6.8	32.8	33.5
Find out about NORPLANT	17.6	8.3	10.4	0.8
Contraceptive use-status				
Using	32.2	6.8	37.0	34.8
IUD	8.3	0.7	4.9	10.4
Pill	17.7	1.5	18.8	7.4
Injectables	1.3	1.5	5.9	0.9
Condom	3.0	2.7	5.8	2.8
Withdrawal	0.6	0.0	0.5	4.6
Other	1.3	0.4	1.1	8.7
Not using	67.8	93.2	63.0	65.2
Total	100.0	100.0	100.0	100.0

Between half and two-thirds of potential acceptors said they would be interested in trying NORPLANT (Table 2—page 52). The proportion who were undecided varied considerably, from only two percent in Haiti and four percent in Nigeria to 11 percent in Nepal and 20 percent in Bangladesh (not shown). Many Bangladeshi women were concerned that their husbands might not approve of the method, and could not say whether they were interested until consulting them.

Because contraceptive use and method choice have been found to vary significantly with a woman's age, parity, fertility desires and education, we looked at the association of these variables with the level of interest in trying NORPLANT. Table 2 shows that in Nepal and Nigeria, potential acceptors 35 years of age or older were nearly twice as likely as those under 25 to be interested in NORPLANT (61 percent vs. 35–36 percent); likewise, those with six or more living children and those who wanted no more children were substantially more likely than those with few children and those who wanted more children to be interested in the method. According to chi-square tests, the associations between women's interest in trying NORPLANT and these characteristics were statistically significant ($p<0.05$).

In Bangladesh as well, interest in NORPLANT was significantly ($p<0.05$) associated with having many living children and with wanting fewer than two additional children. In Haiti, on the other hand, only age was significantly associated with interest in trying the method. In Bangladesh and Nepal, women with no education were more likely to be interested in trying the implants than were

---

*It was surprising that such a substantial proportion of Haitian respondents (and smaller proportions of those in the other countries) had heard of the method well before their clinic visit. No NORPLANT media campaigns were under way in the areas where the acceptability surveys were conducted. In addition, the clinical trials were the very first such trials to be organized in these countries and were carried out on a small scale. Thus, most information on NORPLANT must have been passed by word of mouth or, occasionally, by health or social workers who were recruiting participants for the preintroductory clinical trials.

Table 2. Percentage of potential acceptors who were interested in trying NORPLANT, by background characteristics and country

Characteristic	Bangladesh	Haiti	Nepal	Nigeria
Total	**54**	**67**	**48**	**52**
Age-group				
<25	49	66	35	36
25–29	55	70	50	46
30–34	59	77	56	54
≥35	56	48	61	61
No. of living children				
0–1	32	60	29	35
2	51	70	43	34
3	61	72	49	37
4–5	62	66	68	50
≥6	66	57	68	66
Desire for more children				
Wants no more	60	65	53	72
Wants more				
After 5 yrs.	54	75	33	63
Within 5 yrs.	14	51	35	33
No. of additional children wanted				
0	60	65	53	72
1	53	69	37	52
≥2	26	69	26	37
Education (yrs.)				
0	60	64	51	52
1–7	50	67	42	54
≥8	48	79	40	50
Youngest child's breastfeeding status and age (mos.)				
Breastfed				
<12	30	52	20	46
Not breastfed				
<12	73	75	72	49
12–23	54	76	40	55
≥24	56	70	64	55
Contraceptive-use status				
Using	62	64	55	49
IUD	54	*	55	39
Pill	64	*	72	45
Injectables	*	*	29	*
Condom	60	*	30	53
Withdrawal	*	*	*	44
Other	*	*	*	64
Not using	50	67	43	54
Prior knowledge of NORPLANT				
Yes	81	71	63	55
No	25	64	30	47
Timing of knowledge				
Day of interview	u	*	u	45
1–14 days before	u	65	u	73
2–4 weeks before	u	69	u	88
>4 weeks before	u	79	u	60
Source of knowledge				
Friend/relative	80	87	58	75
Clinic	83	50	48	51
Health worker	*	*	82	*
Other	*	*	*	56

*Percentages not calculated because there were fewer than 15 observations.

Note: u=unavailable.

women with some education, while in Haiti, women with the most education were most interested in NORPLANT. In Nigeria, there was very little variation in interest according to amount of schooling.

Except in Nepal, women who desired children in the next five years were much less likely than others to be interested in trying NORPLANT. Furthermore, except in Haiti, interest was higher among those who wanted no more children than among those who wanted to wait five years. Interest in trying NORPLANT was greater among women who had heard of the method prior to the interview than among those who had not. Among women who had already heard about NORPLANT, interest in trying the method was lower in Nigeria (55 percent) than in Bangladesh (81 percent), Haiti (71 percent) or Nepal (63 percent); however, a large proportion of Nigerian women had heard about the method only on the same day as the interview, leaving them less time to consider using it. (Only 45 percent of Nigerian women who had heard of NORPLANT on the day of the interview were interested in trying it, roughly the same proportion as among women who had never heard of NORPLANT.)

Interest in NORPLANT in Nepal was higher among women who had heard about the method from health workers and family planning motivators who visited them in the village (82 percent) than among those first informed by friends or relatives (58 percent) or by clinic personnel (48 percent). In Bangladesh, interest was highest among women who had first heard about NORPLANT at the family planning clinic, while in Haiti and Nigeria, interest was highest among those who had first heard about it from a friend or relative.

Women in Bangladesh and Nepal who were current method users but wanted to switch methods were more interested in trying NORPLANT than were nonusers, a relationship not seen in Nigeria or Haiti. In Bangladesh and Nepal, pill users were the most interested in trying NORPLANT, while in Nigeria women who used "other" methods (predominantly abstinence) showed the highest interest. In Haiti, there were too few observations to allow method-specific assessment of interest. Problems with pill compliance, observed in many countries,[6] may be the reason that pill users found NORPLANT an especially attractive alternative.

Table 3 shows that in Nepal, among women interested in trying NORPLANT, the method's reversibility and the woman's feeling that sterilization was not yet appropriate for her were the reasons mentioned most frequently as being important in their desire to try NORPLANT (by 85 percent and 81 percent of respondents, respectively). In Bangladesh and Haiti, on the other hand, the method's effectiveness (mentioned by 76 percent and 99 percent) and convenience (mentioned by 73 percent and 97 percent) were the most important reasons. In Nigeria, the fact that NORPLANT is a new and promising method and is highly effective were the reasons most frequently cited by women who wanted to try it (by 96 percent and 95 percent, respectively).

Table 4 shows that in all countries, the largest proportions of women who elected not to use NORPLANT cited a preference for other methods as a reason (51–83 percent). Fear of side effects was the next most frequently mentioned reason in Bangladesh, Nepal and Nigeria, (given by 69, 48 and 45 percent, respectively). Approximately one-third of the women in each country said that their husband would not approve and that this was an important factor in their decision, making this reason the second most frequently cited in Haiti and the third most often cited in Nepal. Fear of insertion and removal procedures was also frequently mentioned; concern about insertion was exceptionally high in Bangladesh. On the other hand, concerns that the capsules would be too visible and that people would know the woman was practicing contraception were not important reasons for lack of interest in trying NORPLANT.

Responses to an open-ended question revealed other important reasons behind some women's decisions not to try NORPLANT, such as concern about possible menstrual irregularities or about the newness of the method, a desire for more children in the next five years (and thus for a method of shorter duration), a perceived need for more information on the method, concern that they were too young or too old to use hormonal implants and not being currently married.

The overall proportion of women interested in trying NORPLANT who actually received it varied considerably across the four countries, from 52 percent in Haiti to 83 percent in Bangladesh (not shown). These differences were probably influenced by the number of women allowed to enter the clinical trials at each center, the volume of clients visiting the clinic and the proportion of respondents who were interested in trying NORPLANT.

There were also variations within countries in the proportion who accepted the method: Among interested women, for example, the proportion who received NORPLANT was positively associated with education. Better educated women may be more likely to see the need for and the benefits of follow-up visits and therefore be more inclined to make them. Consequently, clinic staff may be more likely to favor educated women in providing NORPLANT: In all four countries, interested women with no education were somewhat less likely to have received NORPLANT than were women with eight or more years of schooling.

Besides the inclusion and exclusion criteria for the clinical trials, other factors probably affected the likelihood that interested women would actually receive NORPLANT, such as selectivity on the part of the clinic staff responsible for recruiting acceptors (for example, the staff's tendency to pick women they considered likely to keep the implants in the longest). The social and demographic variations could also be due to differences in the availability of other temporary methods and of sterilization, factors that might limit or expand a woman's contraceptive options depending on her age or parity, for example.

Discussion

Contraceptive acceptability studies can contribute to increased method acceptance and continuation by identifying issues and concerns that can direct the development of informational and motivational material useful for dispelling rumors and misinformation about the method and for improving service delivery. Such studies may also help to identify the obstacles that prevent some women who find a method acceptable from actually using it.

Studies such as those described in this article should help programs identify social or cultural factors and concerns about the method that might impede or enhance both the acceptance of NORPLANT and that of other long-acting steroidal contraceptives. For example, a clinic client may be interested in using the method but afraid to undergo the necessary physical examination, especially if the doctor is male. Other women may first have to ask their husbands for permission to use NORPLANT (or may fear to do so). Financial obstacles or problems of accessibility to the clinic may also reduce acceptance of the method by some interested women. Other women may be interested in the method but at too early a stage in their reproductive life to consider such a long period for spacing births.

The acceptability surveys conducted in these four countries revealed a relatively high level of interest in using NORPLANT among potential acceptors. Many women mentioned that they liked various aspects of the method, such as its reversibility, effectiveness and convenience. Although the survey identified some potential obstacles to NORPLANT acceptance (such as concerns about menstrual irregularities and about husband's disapproval), interest in trying the method appears high. We have also identified a target group of potential acceptors most likely to want to try the method: women in their late 20s or older who have had a few children and who are interested either in spacing births for at least several years or in limiting births but who are not ready to use a permanent method.

The results of the surveys also point to the need for thorough counseling to reduce the apprehensions that both women and their husbands may have about this new method. Service providers must pay close attention to women's concerns regarding such issues as menstrual irregularities, insertion and removal procedures, side effects and return to fertility. In particular, the bleeding and other menstrual irregularities that some women experience while using NORPLANT could reduce the overall acceptability of the method in societies with strict customs and practices relating to menstruation. Additionally, in countries where the status of women is low and their rights limited, the husband's knowledge and approval of a method are likely to be important determinants of acceptability. Thus, because husbands can be an obstacle to women's acceptance of NORPLANT, service providers should increase their efforts to involve husbands in counseling services and information dissemination.

In the analysis reported here, we did not attempt to differentiate interest in NORPLANT from interest in other long-acting reversible methods. Thus, we do not know whether the responses would have been the same if the method described had been a new six-month injectable or a new IUD. Preference for other methods was a major reason potential acceptors gave for not wanting to try NORPLANT. Perhaps the next step is to investigate preferences for NORPLANT versus preferences for other new long-acting methods, in terms of both initial acceptance and continuation. Another approach could be to look at the acceptability of NORPLANT relative to that of IUDs for women who wish to space births for a year or more. Since both implants and IUDs must be inserted and removed by a trained medical person, an evaluation of the relative popularity and acceptability of each might be worthwhile. Furthermore, in countries where NORPLANT has been available for some time, it might be useful to conduct population-based acceptability surveys to assess general attitudes toward, perceptions of and interest in the method. One such study has been conducted, in Sri Lanka.[7] Continuing efforts should be made to monitor the interest in, acceptance of, satisfaction with and continuation of NORPLANT use as this method becomes an increasingly important contraceptive option.

Table 3. Percentage of respondents interested in trying NORPLANT who reported that various preselected reasons were important in their decision, by country

Reason	Bangladesh (N=444)	Haiti (N=275)	Nepal (N=388)	Nigeria (N=281)
Effectiveness	76	99	75	95
Newness and promise	61	97	67	96
Safety	61	87	60	92
Convenience	73	97	72	94
Reversibility	66	70	85	84
Unreadiness for sterilization	41	69	81	50

Table 4. Percentage of respondents not interested in trying NORPLANT* who reported that various preselected reasons were important in their decision, by country

Reason	Bangladesh (N=377)	Haiti (N=136)	Nepal (N=426)	Nigeria (N=259)
Prefers other method	73	83	51	71
Fears side effects	69	36	48	45
Fears insertion	50	38	33	31
Fears removal	20	38	32	31
Believes method is not good for her	43	24	34	38
Fears husband's disapproval	34	41	37	29
Does not want capsules in body	19	26	36	30
Believes method may show in arm	4	8	22	17
Fears people may know she is using a method	1	7	15	12

*Includes those who were undecided.

References

1. S. J. Segal, "The Development of NORPLANT Implants," *Studies in Family Planning,* **14**:159, 1983.

2. J. Marshall, "Acceptability of Fertility-Regulating Methods: Designing Technology to Fit People," *Preventive Medicine,* **6**:65, 1977.

3. A. Keller, "Contraceptive Acceptability Research: Utility and Limitations," *Studies in Family Planning,* **10**:230, 1979.

4. S. Diaz et al., "A Three-Year Clinical Trial with Levonorgestrel Silastic Implants," *Contraception,* **19**:557, 1979; S. Satayapan, K. Kanchanasinith and S. Varakamin, "Perceptions and Acceptability of NORPLANT Implants in Thailand," *Studies in Family Planning,* **14**:170, 1983; F. Lubis et al., "One-Year Experience with NORPLANT Implants in Indonesia," *Studies in Family Planning,* **14**:181, 1983; I. Sivin et al., "A Four-Year Clinical Study of NORPLANT Implants," *Studies in Family Planning,* **14**:184, 1983; A. K. M. S. Ahmed, "Preliminary Consultant Report on NORPLANT Clinical Trial Conducted in Three Centers of Bangladesh," paper presented at the Co-Investigators and Social Workers Meeting, Bangladesh Fertility Research Programme, Dhaka, June 28, 1986; F. C. Greenslade, J. Spicehandler and J. Bruce, "Determinants of User Satisfaction with the NORPLANT Contraceptive Method and Its Service Delivery System: A Proposal to the International Development Research Centre," The Population Council, New York, 1986; and S. Basnayake, S. Thapa and S. Balogh, "The New Contraceptive NORPLANT Implants: One-Year Evaluation of Their Safety, Efficacy and Acceptability in Sri Lanka," paper presented at the annual meeting of the American Public Health Association, New Orleans, Oct. 18–22, 1987.

5. S. N. Mitra, *Bangladesh Contraceptive Survey 1985,* Mitra and Associates, Dacca, 1987.

6. L. Potter et al., "Oral Contraceptive Compliance in Rural Colombia: Knowledge of Users and Providers," *International Family Planning Perspectives,* **14**:27, 1988.

7. S. Thapa et al., "Assessing Potential Demand for NORPLANT in the General Population: Test of an Approach in Sri Lanka," paper presented at the annual meeting of the National Council for International Health, Washington, D.C., June 14–17, 1987.

Resumen

Un estudio de 2.586 posibles aceptantes de implantes contraceptivos hormonales NORPLANT® que fueron entrevistadas en 10 clínicas de planificación familiar en Bangladesh, Haití, Nepal y Nigeria revela un alto nivel de interés: De 48 a 67 por ciento de las entrevistadas que habían acudido a las clínicas para empezar el uso anticonceptivo o para obtener información acerca de NORPLANT, y que se consideraban como posibles aceptantes de implantes, expresaron interés en el método. Una gran proporción de las mujeres identificó la eficacia, la reversibilidad y la conveniencia de los implantes como sus aspectos más atrayentes. Las mujeres mayores de 25 años que ya tuvieron varios hijos y que querían limitar o espaciar los partos por lo menos unos años, pero que no estaban dispuestas todavía a esterilizarse, eran las más interesadas en NORPLANT. Los resultados también demuestran la necesidad de tener un programa de asesoramiento cabal a fin de reducir las aprensiones que las mujeres y sus maridos puedan sentir con respecto al método, como por ejemplo, miedo de los efectos secundarios o del procedimiento de inserción y extracción.

Résumé

L'analyse de 2.586 femmes potentiellement prêtes à accepter l'implant contraceptif hormonal NORPLANT®, selon les résultats d'entrevues organisées dans 10 cliniques de planification familial au Bangladesh, à Haïti, au Népal et au Nigéria, révèle un degré d'intérêt élevé pour la méthode NORPLANT: entre 48 et 67 pour cent des femmes interrogées qui s'étaient adressées aux cliniques pour entamer une méthode contraceptive ou s'informer sur la méthode NORPLANT et qui étaient considérées comme potentiellement prêtes à accepter l'implant ont exprimé leur intérêt pour la méthode. Une grande partie d'entre elles ont souligné parmi les caractéristiques les plus attrayantes de l'implant son efficacité, son caractère réversible et sa commodité. Les femmes aux alentours de la trentaine ou plus, déjà mères de plusieurs enfants et souhaitant soit espacer les naissances de quelques années au moins soit tout simplement les limiter, mais n'étant pas encore prêtes à se faire stériliser, se sont avérées les plus susceptibles d'intérêt pour la méthode NORPLANT. Les résultats de l'analyse soulignent également le besoin d'une consultation approfondie afin de dissiper les appréhensions ressenties par la femme et son conjoint au sujet de la méthode, notamment la crainte d'effets secondaires ou de la procédure d'insertion ou de retrait de l'implant.

Characteristics of Chinese Children

(Continued from page 48)

hijos únicos residentes en zonas urbanas demostraron un desempeño escolar marcadamente superior a la de sus pares no hijos únicos; no se verificó ninguna diferencia en esta medida entre los niños residentes en zonas rurales. A pesar de que los maestros de los niños tendían a evaluar a los hijos únicos como más virtuosos y competentes que los niños con hermanos, la evaluación de los niños por sus propios padres, usando las mismas medidas, no revelaron mayores diferencias entre los dos grupos.

Résumé

Une étude des effets de la politique démographique chinoise sur les résultats scolaires et la personnalité de l'enfant unique a été entreprise en 1987 parmi les écoliers de Changchun, dans la province de Jilin. Les résultats ne sont pas venus confirmer les rapports publiés dans la presse chinoise et occidentale selon lesquels la politique chinoise de l'enfant unique était en train de créer une génération d'enfants gâtés. Dans l'ensemble, les résultats scolaires de l'enfant unique se sont révélés sensiblement supérieurs à ceux de ses camarades non uniques, mais l'on n'a relevé aucune différence majeure au niveau de la personnalité. Dans les sous-catégories de résidence en milieu urbain ou rural et par année d'études, on a observé des résultats scolaires sensiblement supérieurs chez les enfants uniques vivant en milieu urbain par rapport à leurs camarades non uniques; aucune différence de la sorte n'est apparue parmi les enfants originaires de milieux ruraux. Malgré une tendance chez les enseignants à qualifier l'enfant unique de plus apte et compétent que l'enfant non unique, l'évaluation par les parents de leurs propres enfants, sur la base des mêmes échelles, n'indique aucune différence majeure entre les deux groupes.

Postpartum Sterilization by Nurse-Midwives in Thailand

"Using nurse-midwives to provide postpartum sterilization services not only frees physicians' time for more demanding procedures but benefits the patients in terms of the added information and attention they receive."

By Kanchana Kanchanasinith, Pattaka Piyapinyo, Pichit Pitaktepsombati, Suvathana Vibulsresth, D. S. Gates, Barbara Janowitz and Mark Robbins

Summary

To increase the availability of sterilization outside urban areas, the National Family Planning Program of Thailand decided to expand a pilot program to train nurse-midwives with operating room experience to perform postpartum sterilization. A comparison of 541 procedures done by nurse-midwives and 279 performed by physicians show that the two provider groups do not differ significantly with respect to the rate of surgical difficulties (2.2 percent among physicians and 3.1 percent among nurse-midwives) or the rate of complications one year after the operation (3.9 percent among physicians and 4.4 percent among nurse-midwives). However, there were significant differences regarding counseling about the operation ($p<0.05$), with nurse-midwives providing more complete information about the surgery than the physicians. The results of this study support the training of nurse-midwives to perform postpartum sterilization.

Introduction

Estimates from the 1987 Thai Demographic and Health Survey indicate that the proportion of women sterilized reached 22 percent in that year,[1] having previously increased from six percent in 1969–1970 to 19 percent in 1981.[2] Slightly over four-fifths of the sterilizations performed in Thailand are done postpartum.[3] Among all women who are sterilized, more than 80 percent obtain the procedure at government hospitals. Not all hospitals, however, are able to offer sterilization services, because of insufficient staff or facilities. Since most of the country's hospitals are located in urban areas, rural women must travel much further than their urban counterparts to receive services. Consequently, there are wide rural-urban differentials in sterilization rates: Among women with two or more living children, 45 percent of those living in urban areas have been sterilized, compared with 30 percent of those in rural areas. Among women who delivered at home, the sterilization rate is especially low (16 percent).[4]

To increase the availability of sterilization services at the provincial level in Thailand, particularly at community and district hospitals where physicians are not always available, a pilot project was undertaken in 1979 to train nurse-midwives to perform postpartum sterilization. It was anticipated that the participation of nurse-midwives would allow hospitals to better meet the demand for sterilization and would free physicians to perform other tasks. Twenty trained nurse-midwives performed 3,549 postpartum sterilizations during a 12-month period.[5] Although the nurse-midwives took longer than physicians to perform the surgery, the rates of operative difficulty and postoperative morbidity did not differ between the two groups. Thus, the pilot project showed that nurse-midwives could successfully perform sterilizations with minimal difficulties and complications. Because of the success of this pilot project, in October 1983 the Thai cabinet approved the use of trained nurse-midwives to carry out postpartum sterilizations under medical supervision.[6]

In 1985, the National Family Planning Program (NFPP) decided to expand the training program throughout the country and initiate a study to further evaluate the provision of sterilization services by nurse-midwives. The collaborating agencies in the study were the Thailand Fertility Research Association, the Institute of Population Studies at Chulalongkorn University in Bangkok and the United States–based Family Health International in North Carolina. The study was designed to compare the performance of physicians and trained nurse-midwives by contrasting surgical events and their immediate and long-term complications. It also attempted to evaluate the patients' impressions of all aspects of the service and their satisfaction with the operation one year later.

During March and April of 1985, the NFPP recruited and trained 33 nurse-midwives who had at least two years of operating room experience and had previously assisted physicians in postpartum sterilizations. (Thirteen had already performed the operation under a physician's supervision.) The training occurred in three provincial hospitals and four regional Maternal and Child Health Centers; a gynecologist at each location provided the training to groups of five nurse-midwives. The 12-week course included two weeks of classes and 10 weeks of clinical practice. All of the nurse-midwives were trained to occlude the Fallopian tubes by the modified Pomeroy method.* The nurse-midwives spent the first two weeks of clinical training observing procedures and acting as assistants during the operation. Then each performed 20 sterilizations, with the gynecologist-trainer assisting. During the last four

---

Kanchana Kanchanasinith is project officer and Pattaka Piyapinyo is research analyst with the Thailand Fertility Association, Bangkok. Pichit Pitaktepsombati is associate professor at the School of Public Administration, National Institute of Development Administration, Bangkok. Suvathana Vibulsresth is assistant professor at the Chulalongkorn University Institute of Population Studies, Bangkok. D. S. Gates is research associate in the clinical trials division, Barbara Janowitz is evaluation specialist in the Office of the President and Mark Robbins is associate director of field development and training at Family Health International, Research Triangle Park, N.C. Although the research on which this article is based was partially funded by the United States Agency for International Development, the views expressed do not necessarily reflect those of the funding agency. The authors would like to thank Rosalie Dominik and Kazu Clark of Family Health International for their help with the statistical analysis of the data.

*The tubes are brought out of the abdomen through a small incision, tied and cut.

weeks of clinical training, the nurse-midwives returned to their respective hospitals and carried out sterilizations under the observation and close supervision of gynecologists at their hospitals.

The Study

The study sample was drawn from seven provincial and eight community hospitals, selected because they had large obstetric caseloads and because nurse-midwives had either been assisting in sterilization procedures or performing them under a physician's supervision. These hospitals are located in four of the country's geographic regions (Northeast, Central, East and North). One physician and one nurse-midwife from each of the 15 hospitals were selected to participate in the study sample. The study design initially called for enrolling a total of 900 women (60 women from each of the 15 participating hospitals) over four months; all postpartum patients who had either requested or been motivated to request sterilization during the period were recruited for the study. Three hundred were to be assigned to the physicians and 600 to the nurse-midwives. However, it was not always possible to maintain a rigid proportionment between the two groups because of competing demands on the physicians' time. By the end of a four-month recruitment period that began in November 1985, 820 women were enrolled in the study, with 541 operated on by the nurse-midwives and 279 by the physicians.

For each sterilization they performed, the providers completed a report summarizing the surgery and any immediate complications. The patients were asked to return to the hospital for follow-up; most did so two weeks after the surgery, although three women returned between two weeks and three months. At the follow-up visit, data on short-term complications were collected. After one year, postcards were sent out reminding patients of a second follow-up visit; at that visit, the women were examined and asked to provide general clinical data (including information on complications, general complaints, medication and pregnancy status). Some of the women who failed to return for the one-year follow-up were visited at home by the nurse midwives. Ninety-one percent of the women in the physician group and 94 percent of those in the nurse-midwife group returned for the first follow-up; the proportions who completed the second were 84 percent and 83 percent, respectively.

Table 1. Percentage distribution of women undergoing sterilization, by social and demographic characteristics, according to sterilization provider, Thailand, 1985

Characteristic	Total (N=820)	Physician (N=279)	Nurse (N=541)
Region			
Northeast	53.8	51.6	54.9
Central	19.6	19.7	19.6
East	14.5	15.4	14.0
North	12.1	13.3	11.5
Age			
<20	1.1	0.7	1.3
20–24	28.9	23.7	31.6
25–29	34.0	37.3	32.3
30–34	21.8	22.6	21.4
≥35	14.1	15.8	13.3
Live births			
1–2	33.0	34.8	32.2
3–4	52.3	50.5	53.2
≥5	14.6	14.7	14.6
Education			
≤3 years	11.3	9.7	12.1
4 years	76.4	77.3	75.9
≥5 years	12.3	13.0	12.0
Total	100.0	100.0	100.0

The patients completed two satisfaction questionnaires, one before discharge from the hospital and one at the second follow-up visit. The first questionnaire, administered by either a nurse or a social worker, contained items on previous contraceptive practice, factors influencing the decision to choose sterilization and the patient's understanding of and satisfaction with the operation. The second questionnaire obtained information on physical complaints, the counseling that patients had received, their assessment of the services provided and their satisfaction with the operation one year after surgery. Clinical data were sent to the Thailand Fertility Research Association for processing and analysis; the responses from the two satisfaction questionnaires were processed by the Institute of Population Studies at Chulalongkorn University. Chi-square tests were used to compare the two groups by clinical and sociodemographic variables. The Fisher's exact test was used when the sample sizes were small.

Results

The distribution of the women's social and demographic characteristics did not differ significantly between the two provider groups ($p<0.05$). As Table 1 shows, the women in both groups were young: Thirty percent were younger than 25 and 34 percent were between 25 and 29 years old. About half of the women had had 3–4 live births and one-third had had 1–2 children. Approximately 75 percent of the women had had four years of education.

The frequency of surgical events associated with the sterilization, defined as either surgical difficulties or injuries, also did not differ significantly between the two provider groups. Surgical difficulties occurred in 2.2 percent of the procedures done by the physicians and in 3.1 percent of those done by the nurse-midwives. In both groups, most of the difficulties were in visualizing and grasping the tubes. There were no surgical injuries in 99 percent of all the procedures performed. Only one woman in each group had a tubal injury. (The woman in the physician group needed a suture to stop bleeding while the one in the nurse-midwife group did not need treatment.) No other complications occurred during surgery in either group. While 84–85 percent overall had no physical problems immediately following the procedure, 87 percent of the physician group and 84 percent of the nurse-midwife group said they had none one month later.

There were no statistically significant differences between the two groups in the number and type of complications that occurred during the surgery and immediately afterwards; there were also no differences in patient complaints reported at the two follow-up visits. According to reports of each surgical intervention, 0.8 percent of women in both groups experienced complications (incision bleeding and healing problems in the physician group and incision infection in the nurse-midwife group). At the one-year follow-up, complications were reported by 3.9 percent of the women in the physician group and 4.4 percent of the patients in the nurse-midwife group. Most of these were complaints of pain in the ovaries, tubes or uterus (adnexal pain). Other less frequent complications included pain at the incision site, hardening beneath the skin and vaginal bleeding. Complications led to hospital readmission of 0.8 percent of the women in the physician group and 0.4 percent of the women in the nurse-midwife group. No pregnancies were reported among either group.

While nine percent of the women reported that they were unable to do household chores for 0–4 days following the surgery, 54 percent said they could not do housework for 5–15 days after surgery, 27–28 percent did none for 16–30 days and nine percent did no housework for more than 30 days. These results reflect a general belief in Thailand that women should not exert themselves for a period after giving birth for fear of bad health later on. Because the women in this study not only

Table 2. Percentage distribution of women undergoing sterilization, by type of personnel who explained the operation, according to sterilization provider

Type of personnel	Total (N=820)	Physician (N=279)	Nurse (N=541)
Provider	49.4	23.6	62.7
Another nurse	15.9	25.8	10.9
Another physician	3.9	8.6	1.5
A family planning worker	3.0	3.6	2.8
Another staff person	1.9	2.2	1.8
Don't know/no explanation given/no answer	25.7	36.2	20.3
Total	100.0	100.0	100.0

were postpartum but also had undergone a sterilization procedure, they may have been extra cautious about performing any chores soon afterwards. Furthermore, Thais often hire a domestic helper to do various chores and many of the women in the study probably did so after their delivery and operation.

The two groups differed significantly with respect to whether or not the person performing the surgery explained the operation to the patient. Table 2 specifies the clinician who provided counseling and the type of information it included. Twenty-four percent of women in the physician group said that the person performing the surgery had explained the procedure to them, while the corresponding proportion in the nurse-midwife group was 63 percent. A nurse explained the procedure to 26 percent of the physicians' patients, and a nurse other than the one performing the operation explained it to 11 percent of the patients in the other group. More than one-third of those in the physician group and one-fifth of those in the nurse-midwife group did not know who had explained the operation to them, had received no explanation or gave no response.

To assess the counseling, the researchers asked the women a series of questions about the information they had received before the operation. As Table 3 indicates, women in the nurse-midwife group were significantly better informed about the operation, its consequences and follow-up care than women in the physician group ($p<0.05$). The difference in the information provided is reflected in the women's understanding of their surgery: Of the nurse-midwife patients, 48 percent were able to correctly identify the surgical procedure as one in which the tubes are cut and tied, while only 35 percent in the physician group were able to do so (not shown).

Almost all of the women in both groups expressed satisfaction with the operation, with only 0.6 percent of those in the nurse-midwife group saying they were dissatisfied. Furthermore, 97 percent of the women said they would recommend sterilization to others. The reasons why 3.5 percent of the women in the physician group and 2.9 percent of those in the nurse-midwife group would not recommend the operation to others were unrelated to the provider, but rather reflected a reluctance to offer advice on a personal matter. Asked if they would still choose to have the sterilization if they were to make the decision again, 96 percent of the women in the physician group and 98 percent of those in the nurse-midwife group said they would.[*]

Discussion

This comparative study confirms that nurse-midwives with operating room experience can be trained to perform postpartum sterilization with as few surgical difficulties and injuries as physicians. The rate of surgical difficulties among the nurse-midwives in the present study was similar to that found in the 1979 pilot project (five percent of 143 procedures)[7] and in a later field trial involving 20 nurse-midwives in northeastern Thailand (three percent of 3,549 operations).[8]

Our study also shows no difference in complication rates at the first follow-up between patients of nurse-midwives and patients of physicians. The rates of complications following surgery were lower in the present study (0.8 percent for both provider groups) than in either the earlier pilot project (seven percent for nurse-midwives and six percent for physicians) or the subsequent field trial (11 percent for nurse-midwives). These higher rates may be partially explained by the different timing of the data collection (prior to hospital discharge in the field trial vs. 15–90 days postsurgery in the present study). Furthermore, complications unrelated to the surgery (e.g., respiratory infections and cystitis) were included in the earlier studies' rates but not in the data presented here. The important clinical implications for the present study, however, lie in that there were no significant differences in the complication rates between the two provider groups.

The results of our study compare favorably with those of an earlier Bangladesh study. That study compared the performance of nursing professionals trained to perform tubectomies with that of qualified physicians.[9] The infection rates were 5.5 percent among the 366 tubectomies done by the nursing professionals and 6.4 percent among the 234 done by physicians. The patients also turned in self-evaluations of their physical problems: Over 84 percent in both groups said they had no physical problems either immediately after the sterilization procedure or one month later.

Table 3. Percentage (and number*) of sterilization patients, by the type of information about the procedure received, according to sterilization provider

Information†	Total	Physician	Nurse
How it is performed	44.1 (790)	34.9 (275)	48.9 (515)
How long it takes	46.5 (790)	38.6 (272)	50.6 (518)
How effective it is	46.3 (774)	37.1 (267)	51.1 (507)
Possible complications	44.2 (767)	36.1 (263)	48.4 (504)
Necessary post-surgery care	77.4 (779)	68.8 (263)	81.8 (516)
Possible effects on menstruation	41.3 (786)	31.2 (269)	46.6 (517)
Indications for further medical treatment	62.5 (786)	53.2 (267)	67.2 (519)

*Ns differ because of the nonresponders.

†The nurse and physician groups differ significantly with respect to each of these variables ($p<0.05$).

Our study followed the sterilization patients for one year after the operation and achieved an 83 percent follow-up rate at one year. No previous study of the suitability of training nurse-midwives has followed patients for longer than six weeks. We found that at one year after the operation, there were a few minor complications among both groups, none of which needed medical intervention. The frequency of these complications, roughly four percent, did not differ significantly between the two provider groups.

In Thailand, the family planning unit in each hospital generally provides counseling for women who seek contraceptive services. The unit's nurse or social worker informs clients about the methods that are available through the unit and the woman then chooses which contraceptive method she would prefer. Hospital staff schedule the procedure for those women who elect to be sterilized. Thus, these women will have already received some information about sterilization before they are referred for surgery. However, it is up to the individual provider to explain the actual surgery and tell patients what to expect afterwards and what postoperative care is required. Our study found that women sterilized by nurse-midwives had more accurate information on the procedure than those operated on by physicians: About half of the nurse-midwives' patients compared with one-third of the physicians' patients said they were told how the operation would be performed, and the same proportions were able to give a basic description of the surgery. One reason for this differential may be that the nursing professionals can spend more time with patients than can physicians, who are in demand for procedures requiring a higher degree of medical expertise. Even though few women in either provider group received complete information, the vast majority were satisfied with their operation. The reasons why very small proportions of women either would not recommend sterilization to others or would not decide to have the operation again if given the chance are not related to whether the procedure was performed by a doctor or a nurse.

---

[*] Patients gave the following reasons for saying they would not make the same decision again, for their dissatisfaction with the operation and for not recommending it to others: needed more children, should have used temporary methods in case more children are needed, had had pain during the operation, had had health problems afterwards, had been too old to undergo a procedure, were afraid of being blamed for interfering in others' affairs, were afraid that other people would not believe them, felt they should let others make their own decisions, and were afraid that other people would experience discomfort.

Not only were the nurse-midwives as proficient as the physicians in performing sterilizations, they also provided more complete information to their patients about the surgery and, more importantly, about postoperative care. Using nurse-midwives to provide postpartum sterilization services not only frees physicians' time for more demanding procedures but benefits the patients in terms of the added information and attention they receive. With funds for family planning in short supply, governments and health programs will need to find innovative ways to make the most of these limited resources. Thailand has been in the forefront in the training of nurses to perform postpartum sterilizations. This cost-effective strategy to maximize medical personnel is rarely considered by administrators of family planning programs, who may fear that nurses would encounter too many difficulties in performing surgery compared with physicians.

As we noted earlier, the prevalence of female sterilization among Thai women is high, although it is far less common among women who live in remote rural areas and tend to deliver at home. In general, female sterilization services are available in district and provincial hospitals only and the procedures have been performed almost entirely by physicians. One advantage in training those nurses who are more available to rural residents is that it improves sterilization accessibility for a group that has long been underserved. It also allows physicians to perform other medical tasks and ultimately increases the number of sterilization providers. The findings of this study support the decision of Thailand's Ministry of Public Health to train more nurse-midwives to perform postpartum sterilizations and should encourage others to consider these nursing professionals as potential providers of sterilization services as well.

References

1. N. Chayovan, P. Kamnuansilpa and J. Knodel, *Thailand Demographic and Health Survery, 1987*, Institute for Population Studies, Bangkok, and Institute for Resource Development/Westinghouse, Columbia, Md., May 1988.

2. P. Kamnuansilpa, *Selected Findings from Thailand's Third Contraceptive Prevalence Survey*, Research Center National Institute of Development Administration, Institute for Population and Social Research, Mahidol University, National Family Planning Program, Ministry of Public Health, Bangkok, 1985.

3. P. Pitaktepsombati and B. Janowitz, "Contraceptive Sterilization in Thailand," *Health and Population Studies Based on the 1987 Thailand Demogrpahic and Health Survey*, Demographic and Health Surveys Further Analysis Series, No. 1, Institute of Population Studies, Chulalongkorn University, Bangkok, Dec. 1989.

4. Ibid.

5. S. Satyapan et al., "Postpartum Tubal Ligation by Nurse-Midwives in Thailand: A Field Trial," *Studies in Family Planning*, **14**:115, 1983.

6. N. Dusitsin and S. Satyapan, "Sterilization of Women by Nurse-Midwives in Thailand," *World Health Forum*, **5**:259, 1984.

7. Ibid.

8. S. Satyapan et al., 1983, op. cit. (see reference 5).

9. S. Chowdhury and Z. Chowdhury, "Tubectomy by Paraprofessional Surgeons in Rural Bangladesh," *The Lancet*, **II**:567, 1975.

Resumen

A fin de aumentar la disponibilidad de servicios de esterilización fuera de las zonas urbanas, el Programa Nacional de Planificación Familiar de Tailandia resolvió ampliar un programa piloto para la capacitación de parteras-enfermeras con experiencia de quirófano para realizar la esterilización postparto. Una comparación de 541 procedimientos realizados por parteras-enfermeras y 279 practicados por médicos revela que no hay grandes diferencias entre ambos grupos en cuanto a la frecuencia de problemas durante la intervención quirúrgica (2,2 por ciento entre los facultativos contra 3,1 por ciento en el caso de las parteras-enfermeras) ni de complicaciones durante el año posterior (3,9 por ciento frente a 4,4, respectivamente). Se observaron, no obstante, diferencias significativas en cuanto al asesoramiento acerca de la operación (p<0,05), pues las parteras-enfermeras brindaban una información más completa que los médicos. Los resultados del estudio aconsejan la capacitación de parteras-enfermeras para realizar la esterilización postparto.

Résumé

Désireux de rendre la stérilisation plus facilement accessible en zones rurales, le Programme national de planification familiale de la Thaïlande a décidé d'étendre un programme pilote de manière à enseigner à des infirmières/sages-femmes ayant déjà travaillé en salle d'opération, à pratiquer la stérilisation post-partum. Une étude comparée de 541 interventions effectuées par des infirmières/sages-femmes et 279 effectuées par des médecins n'a révélé aucune différence significative entre les deux groupes de professionnels en ce qui concerne le taux de difficultés chirurgicales (2,2 pour cent parmi les médecins et 3,1 pour cent parmi les infirmières/sages-femmes) ou le taux de complications un an après l'intervention (3,9 pour cent parmi les médecins et 4,4 pour cent parmi les infirmières/sages-femmes). Il existait, cependant, des différences significatives quant aux conseils donnés au sujet de l'intervention (p<0,05), les infirmières/sages-femmes fournissant des informations plus complètes au sujet de l'intervention que ne le font les médecins. Les résultats de cette étude soutiennent la formation des infirmières/sages-femmes pour pratiquer la stérilisation post-partum.

Induced Abortion: A World Review, 1990

"The absence of restrictions does not guarantee that [abortion] services will be available. In India and Bangladesh, the overall shortage of medical facilities makes legal abortion and menstrual regulation unavailable to most women."

By Stanley K. Henshaw

Summary

The worldwide trend toward liberalization of abortion laws has continued in the last four years with changes in 10 countries. Laws have also become more restrictive in four countries but in ways that will affect few women. Forty percent of the world's population now lives in countries where no specific justification is required to obtain an abortion, and 25 percent lives where an abortion is allowed only if the woman's life is in danger.

Legal abortion rates range from a high of at least 112 abortions per 1,000 women of reproductive age in the Soviet Union to a low of five per 1,000 in the Netherlands. In recent years, abortion rates have been increasing in Czechoslovakia, England and Wales, New Zealand and Sweden and declining in China, France, Iceland, Italy, Japan, the Netherlands and South Korea.

Mortality from legal abortion averages 0.6 deaths per 100,000 procedures in developed countries with data. Abortion services are increasingly being provided outside of hospitals, and for those performed in hospitals, overnight stays are becoming less common. Suction curettage and dilatation and evacuation, the safest methods, are increasingly being used in developed countries but are unavailable in some developed as well as developing areas, especially where abortion is legally restricted.

Introduction

Induced abortion—both legal and illegal—has important public health and demographic implications that are often overlooked. For epidemiologists and health planners concerned with maternal health, information on abortion is important in designing and implementing programs to reduce the adverse effects of unsafe abortions. Demographers are interested in the effects of induced abortion on fertility and population growth, while family planning program specialists use abortion rates as one way of gauging the need for contraceptive services and measuring program impacts.

This article summarizes the latest information on abortion laws and policies, as well as the incidence and health implications of abortion. It updates the data in an earlier publication by The Alan Guttmacher Institute, *Induced Abortion: A World Review, 1986,* that contained a summary of the legal status of abortion in all countries; statistics on the number and characteristics of women who obtain abortions in countries where such data are available; information about abortion procedures, related morbidity and mortality and the effects of policy changes; and a section on the statistical methods used.*

Laws and Policies

Around the world, laws governing induced abortion range from those prohibiting abortion with no explicit exceptions to those establishing it as a right of pregnant women. Table 1 (page 60) classifies all countries and dependent territories† with populations of one million or more according to the criteria under which women may legally obtain an abortion. Some 52 countries of this size, containing 25 percent of the world's population, fall into the most restrictive category, where abortions are prohibited except when the woman's life would be endangered if the pregnancy were carried to term. In some of the countries in this category, statutes prohibit abortion without explicit exception—even if the life of the pregnant woman is in danger. But in most if not all cases, implicit provisions in the statutes or general principles of criminal law permit abortion to save the life of a pregnant woman.

Forty-two countries of at least one million people, comprising 12 percent of the world's population, have statutes authorizing abortion on broader medical grounds—to avert a threat to the woman's general health (not limited to the risk of losing her life) and sometimes for genetic or juridical indications, such as rape or incest—but not for social indications alone or on request. Some of the statutes permit abortion only when the woman's physical health is threatened, while others explicitly or by interpretation include her mental health as well.

Twenty-three percent of the world's population live in the 13 countries of one million or more people that allow abortions for social or social-medical indications; that is, adverse social conditions can either justify termination of a pregnancy or be considered in evaluating a threat to the woman's health. In many of these countries, including Australia, Finland, Great Britain, Japan and Taiwan, abortion is available for virtually any reason that the woman and her physician judge important.

The least restrictive category includes the 25 countries where abortion is permitted up to a certain point in gestation without requiring that specific indications be present. Some of the world's most populous countries—China, the Soviet Union and the United States, as well as about half of the European countries—are in this category, which contains about 40 percent of the world's population. In some of these

---

Stanley K. Henshaw is deputy director of research at The Alan Guttmacher Institute. The author thanks the Rockefeller Foundation for the funding that made this project possible, Evelyn Morrow for invaluable assistance in compiling data and constructing tables, Jacqueline Darroch Forrest and Henry David for helpful comments on earlier drafts of this article, and the many colleagues, too numerous to name here, in all parts of the world who generously provided information.

*A complete set of updated tables with statistics for each country for all available years may be obtained from the author.

†In subsequent references, "countries" is used to refer to all areas for which data are presented.

Table 1. Countries, by criteria for abortion, according to region, June 1, 1990

Law	Africa	Asia & Oceania	Europe	North America	South America
To save a woman's life	Angola Benin Botswana Burkina Faso Central Afr. Rep. Chad Côte d'Ivoire Gabon Libya Madagascar Malawi Mali Mauritania Mauritius Mozambique Niger Nigeria Senegal Somalia Sudan Zaire	Afghanistan Bangladesh Burma Indonesia Iran Iraq Laos Lebanon Oman Pakistan Philippines Sri Lanka Syria United Arab Emirates Yemen Arab Rep. Yemen, Peoples' Democratic Rep.	Ireland	Dominican Rep. El Salvador*,† Guatemala Haiti Honduras Mexico* Nicaragua Panama	Brazil* Chile Colombia Ecuador* Paraguay Venezuela
Other maternal health reasons	Algeria Cameroon* Congo Egypt† Ethiopia Ghana*,† Guinea Kenya Lesotho Liberia*,† Morocco Namibia*,† Rwanda Sierra Leone South Africa*,† Tanzania Uganda Zimbabwe*,†	Hong Kong*,† Israel*,† Jordan* Korea, Rep. of *,† Kuwait† Malaysia*,† Mongolia Nepal New Zealand*,† Papua New Guinea Saudi Arabia Thailand*	Albania Northern Ireland Portugal*,† Spain*,† Switzerland	Costa Rica Jamaica Trinidad & Tobago	Argentina* Bolivia* Guyana Peru
Social and social-medical reasons	Burundi Zambia†	Australia† India*,†,†† Japan*,†,‡‡ Korea, Dem. Rep.*,† Taiwan*,†	Finland*,†,‡,§ German Fed. Rep.*,†,§,§§ Great Britain†,*† Hungary*,†,‡,§ Poland*,§,‡‡		Uruguay*,**
No specific reason required	Togo Tunisia§	China Singapore*† Turkey*§ Vietnam	Austria§,§§ Belgium*‡ Bulgaria§ Czechoslovakia§ Denmark§ France§ German Dem. Rep.§ Greece§ Italy§ Netherlands Norway§ Romania§ Soviet Union§ Sweden†* Yugoslavia*§	Canada Cuba*§ Puerto Rico United States	

*Includes juridical grounds, such as rape and incest.

†Includes abortion for congenital defects.

‡Approval is automatic for women who meet certain age, marital and/or parity requirements.

§During the first three months or 12 weeks.

**Not permitted for health reasons but may be permitted for serious economic difficulty.

††During the first 20 weeks.

‡‡No formal authorization is required, and abortion is permitted in doctor's office; thus, abortion is de facto available on request.

§§Gestational limit is for interval since implantation.

*†During the first 24 weeks.

*‡During the first 14 weeks for women "in distress."

*§During the first 10 weeks.

†*During the first 18 weeks.

Notes: Table does not include countries with fewer than one million inhabitants or those for which information on the legal status of abortion could not be located (e.g., Bhutan and Kampuchea). Unless otherwise indicated in footnotes, gestation limits are at fetal viability or are unknown or undefined.

countries—for example, Sweden and Yugoslavia—abortion is defined explicitly as a right of a pregnant woman up to a certain point in gestation.

Even where abortion is available legally, abortion services are generally subject to the restrictions that apply to other types of medical or surgical care. For example, in most if not all countries, abortion services may be provided only by licensed medical personnel and only with the consent of the woman. Most if not all countries with liberalized abortion laws do have gestation limits (as shown in Table 1) beyond which health or other indications are required for the procedure to be permitted. Twelve weeks from the last menstrual period is the most common limit, but limits of from 10 to 24 weeks also exist, as well as laws that simply specify the point of fetal viability as the limit.

A variety of other restrictions exist throughout the world, the most common being parental notification or consent for minors, waiting periods, compulsory counseling and the prohibition of abortions in profit-making facilities. According to a recent analysis, spousal authorization requirements exist in several developing countries, including Kuwait, Taiwan and Turkey;[1] however, in countries without statutory provision for spousal consent, there have been no known cases in which "a husband's claim of veto [has] been judicially upheld."[2]

It should be emphasized that the formal classification of the laws does not necessarily reflect their restrictiveness in actual practice. For example, among countries whose laws permit abortions only for maternal health reasons, practices in Africa and Latin America allow very few legal procedures, while those in Israel, New Zealand and South Korea allow rates of abortion comparable to those in countries without restrictions on the reasons women may obtain abortions. Legal interpretations of the same law can even vary widely within a country, as in Switzerland, where the exception for medical reasons is interpreted very liberally in some cantons and very narrowly in others.

Restrictive laws do not necessarily mean that safe abortion services are unavailable. Services may exist despite legal constraints because laws are either interpreted with flexibility or not vigorously enforced or because physicians are willing to risk prosecution. Abortion is restricted in several countries that permit menstrual regulation (a procedure identical to an early abortion but performed without a pregnancy test). The government of Bangladesh, for example, supports clinics that provide menstrual regulations up to 10 or 12 weeks' gestation as a public health measure. Menstrual regulations are also performed in some areas of Indonesia.[3]

Similarly, in Latin America, although abortion providers are sometimes prosecuted, virtually all major cities have physicians who perform abortions and some have clinics that specialize in the procedure.

On the other hand, the absence of restrictions does not guarantee that services will be available. In India and Bangladesh, the overall shortage of medical facilities makes legal abortion and menstrual regulation unavailable to most women. Likewise, despite the relaxation of abortion restrictions in Ghana, and their elimination in Togo, the availability of services has changed little in those African nations. In Zambia, women commonly attempt illegal abortions and then go to a hospital for treatment of complications because few legal abortions can be done under current laws and resource limitations.

From the second half of the century through World War II, abortion was highly restricted almost everywhere. Liberalization of abortion laws occurred in most of the countries of Eastern and Central Europe in the 1950s and in almost all the remaining developed countries during the 1960s and 1970s. A few developing countries also relaxed their restrictions on abortion during the same period, most notably China and India. By mid-1986, abortions could be legally obtained for health reasons in North America and in every European country except Belgium and the Republic of Ireland.

In most countries, safe abortions could be obtained privately from a number of physicians even before the laws were liberalized, and in some, safe services were widely and openly provided. Among the latter countries were Belgium, Greece, Malaysia, the Netherlands, Taiwan and Turkey. In Belgium, for example, abortions were provided through a network of nonhospital clinics as well as in a number of hospitals and physicians' offices.

Since 1986, further liberalization of laws has occurred in 10 countries of one million or more. Most recently, in 1990, Belgium revised restrictions dating from 1867 to permit abortions up to 14 weeks in approved facilities for women "in distress" as a consequence of an unwanted pregnancy. Bulgaria in 1990 and Czechoslovakia in 1986 eliminated requirements that abortions be approved by a committee and be performed for medical or social reasons only; in these countries, no specific justification for early abortion is required. In 1988, the Canadian Supreme Court voided the law allowing abortions only in hospitals and only on medical grounds after committee approval; the House of Commons has passed a new law that would permit abortion if a doctor believes that continuing the pregnancy could threaten the woman's physical, mental or psychological health. Greece revised a restrictive law in 1986 to allow first-trimester procedures without regard to the woman's reasons.

The abortion law in Hungary has been liberalized to permit abortions on request to married women with two living children (reduced from at least three children), and the approval of a committee is no longer needed. As before, abortion is permitted for women who have health, fetal defect or juridical indications, are unmarried, have been separated for at least six months, are older than 35 or have inadequate housing. Women not meeting the above conditions may apply for approval if they have another "social reason" for terminating the pregnancy.

In Malaysia, the law permitting abortion only in cases of life endangerment was broadened in 1989 to allow the procedure when performed by a medical practitioner who is of the opinion that continuing the pregnancy would involve injury to the mental or physical health of the pregnant woman greater than that if the pregnancy were terminated.

First-trimester abortions had been available on request in Romania from 1957 to 1966. Then in 1966, the government imposed severe restrictions on abortion, prohibited the importation of contraceptives and took other measures to encourage population growth; illegal abortions became increasingly common in succeeding years, reaching a higher rate than in any Western European country in which abortion was legal, according to official government statistics. In 1986, Romania renewed measures to suppress abortion and taxed both unmarried persons over age 25 and married couples who remained childless for more than two years without a medical reason.[4] According to press reports, the new Romanian government lifted the 1966 and 1985 restrictions on abortion as of January 1, 1990.[5]

In Vietnam, all reference to abortion was omitted from the criminal law in 1986, although abortion on request was already legal. In addition, the grounds for second-trimester abortions have been broadened in the Soviet Union to include a number of social indications, reportedly to reduce the number of illegal procedures.[6]

In addition to the countries named above, all of which have populations of one million or more, several smaller states have liberalized their abortion laws, including Cape Verde, Cyprus, French Polynesia and Liechtenstein.

One country, Great Britain, is changing its laws in ways that are both more restrictive and more liberal. The new law, which has been passed by the House of Commons but has not yet received final approval, reduces the gestation limit for most abortions from 28 to 24 weeks, formalizing a limit that had been honored in practice since 1985. Abortions to prevent serious or permanent injury to the physical or mental health of a pregnant woman and in cases of fetal abnormality, however, would be permitted beyond the former limit of 28 weeks. In addition, criminal sanctions for violation of the law were removed.

Since 1986, four countries have changed their abortion laws or policies to be more restrictive, although in most cases the changes will have little practical effect. In Chile, where the constitution protects the right to life before birth, a law was approved in 1989 that prohibits abortion without exception, thus eliminating any possibility of legal therapeutic abortion. Similarly, the Philippines adopted a constitution that protects "the life of the mother and the life of the unborn from conception."[7] Japan is in the process of reducing gestation limits from 24 to 22 weeks from the last menstrual period. The change is planned to take effect on March 1, 1991.

In the United States, several states imposed restrictions between 1986 and 1990: Public funding for poor women has been discontinued in one state and in the District of Columbia, leaving such funding available in only 13 of the 50 states; five states have been added to the nine that require parental notification or consent (or, alternatively, a court order) for women under age 18; and abortions have been prohibited in government hospitals and clinics in two states in addition to the two that already had such restrictions. In addition, a Supreme Court decision in 1989 indicated that states might be permitted to impose at least some restrictions that had not previously been permitted.[8] Only one state has yet enacted restrictions under the new decision, but others are considering such legislation. However, even if protection for abortion rights is eliminated from the federal constitution, abortion will remain legal and available in many or most states because of the protection guaranteed under state constitutions or because of decisions made in state legislatures.

Incidence of Abortion

Table 2 shows the abortion numbers, rates and ratios among countries with populations of more than 300,000 for which official statistics could be obtained or for which estimates are available.* Not surprisingly, the most complete and accurate data available are those for developed countries and countries where abortion is legal. The first panel lists countries with data thought to be accurate within 20 percent of the true incidence, as well as a few countries for which there is limited evidence as to accuracy. The data were compiled primarily by government agencies and were obtained either from published reports or from persons with access to official statistics.

The middle panel of Table 2 contains official statistics that are probably low by at least 20 percent because of unreported legal abortions (in Bangladesh, France, the Federal Republic of Germany [West Germany], India, Italy,† Japan, Poland and the Soviet Union) or illegal abortions (in Bangladesh, India and probably the Soviet Union). The figures for Ireland include only those women who obtained an abortion in England and gave an Irish address; the number who gave an English address is unknown. The Romanian data reflect mainly illegal abortions and may either underestimate or overestimate true incidence; they exclude illegal abortions that did not require treatment but may include spontaneous abortions that were treated.

The data in the bottom panel, derived from a variety of sources, may be incomplete. Still, they indicate the magnitude of abortion incidence in a few populous countries and may be more accurate than the official statistics for Bangladesh, Japan and the Soviet Union. The figures for Bangladesh[9] and Spain[10] are derived from surveys of abortion providers and are probably fairly complete for legal procedures, but large numbers of illegal abortions are omitted, especially in the Bangladesh data. The Japanese data[11] are based on calculations of the number of pregnancies expected given the contraceptive use rates; the estimate of 2.3 million is about three times the official reported number for that year. The estimates for South Korea[12] and Turkey[13] are derived from population surveys that asked married women about their histories of legal and illegal abortions. The estimated abortion numbers and rates for these countries are thus conservative, since induced abortions tend to be underreported even in communities where the practice is widely accepted.[14] The estimates for the Soviet Union[15] may also have some downward bias because of underreporting, although the survey on which they are based was conducted only in the Russian Republic, which has a higher official abortion rate than the other Soviet republics. For Switzerland, 54 percent of the data are statistics from cantons that collect data, and the rest are estimates.[16]

Of the countries shown in Table 2, the Soviet Union has the highest abortion rate—112 per 1,000 women aged 15–44, as calculated from official data. That nation's abortion ratio is also high; officially, 55 percent of all known pregnancies are terminated by abortion, but because of illegal abortions and unreported legal abortions, the true rate is probably higher than the official figures indicate.[17] The survey results shown in Table 2 produce an estimate of 181 abortions per 1,000 women of reproductive age, suggesting that a significant proportion of abortions are performed outside the official system. Within the Soviet Union, the republics vary widely in abortion utilization; for example, in 1985, the abortion ratio calculated from official statistics ranged from 66 percent of pregnancies ending in abortion in the Russian Republic to 18 percent in Tadzhik.[18]

Abortion rates and ratios are relatively high in the Eastern and Central European countries as well, where rates range from 27 per 1,000 women of reproductive age in the German Democratic Republic (East Germany) to 71 per 1,000 in Yugoslavia. Except for East Germany, these countries have a history of reliance on abortion, which was legalized in the 1950s before modern contraceptive methods were fully developed. In addition, the full range of modern contraceptive methods is not readily available in most of Eastern and Central Europe and the Soviet Union. In Japan, hormonal methods have been approved for medical purposes (regulating menses) but not for contraception. The Japanese abortion rate may also be relatively high, although it has fallen in recent years and is difficult to estimate.

Abortion rates in most of the remaining developed countries range from 11 to 20 per 1,000 women of reproductive age, although the U.S. rate is higher (27 per 1,000). Italy's rate is also probably well above this range when unreported abortions are taken into account.[19] The rates for the Netherlands, Scotland and Switzerland are below the range found in most developed countries. Those reported for Belgium and Ireland—countries that have very restrictive laws—are also low, but are not significantly lower than the rate for the Netherlands, a country with one of the world's most liberal abortion laws. The low rate reported for Spain, where clinics have just begun to provide services, is based on a survey that might have missed some providers and that excludes illegal abortions.

Abortion rates tend to be higher in those developing countries with liberal abortion laws than in the developed countries, although there is a wide variation in rates. Cuba, South Korea and Turkey have rates of over 40 abortions per 1,000 women of reproductive age. Tunisia, on the other hand, has the relatively low rate of 14 per 1,000, in spite of a liberal law and government-supported services. (The Tunisian statistics, however, omit legal abortions performed in the private sector; in 1980 these were estimated to equal 15–20 percent of the reported abortions.[20])

The rate of menstrual regulation in Bangladesh is relatively low at 12 per 1,000 women of reproductive age because services are unavailable in many rural areas, and in others, women are unaware of existing services. Based on the assumption that one abortion death occurs for every 100 illegal abortions, one study used mortality data to estimate that 780,000 illegal abortions are performed each year.[21] If this estimate is accurate, the illegal abortion rate in Bangladesh is three times the rate of menstrual regulation. Many clandestine abortions are performed in India as well because of a similar lack of medical services in rural areas. India's legal abortion rate is probably two to five times the reported rate of three abortions per 1,000 women, since only a fraction of the legal abortions, mainly those in government hospitals, are reported.

The total abortion rate given in Table 2 represents the number of abortions that 1,000 women could expect to have during their reproductive lifetimes, given present age-specific abortion rates. For example, at present rates of abortion in the United States, 1,000 women would have 797 abortions during their lifetime. Czechoslovakia and Hungary have rates over 1,000, meaning that the average woman in those countries would have more than one abortion during her lifetime. If accurate data were available, total abortion rates would probably be as high or higher in Cuba, Japan, South Korea, the Soviet Union, Turkey and Yugoslavia and perhaps other countries as well.

---

*Scotland is included as a separate country because complete, accurate statistics are available and because its utilization of abortion differs from that of England and Wales.

†In Italy and possibly in other countries, the unreported abortions are technically illegal even if performed by a physician, because reporting and other administrative requirements are not met.

Among countries with complete data for a recent three-year period, usually 1984–1987, legal abortion rates have remained relatively stable in most, but significant changes have taken place in some. The largest increase in the legal abortion rate (35 percent) occurred in Czechoslovakia, and much of that may be attributable to the elimination of abortion approval committees. Legal rates also increased by more than 10 percent in England and Wales, New Zealand and Sweden. One source has suggested that the higher Swedish rate may be a result of an increased emphasis on AIDS prevention that has led to a greater use of condoms at the expense of more effective methods.[22]

Declines in abortion rates occurred in Iceland and the Netherlands. The drop in the Netherlands appears to represent a continuing recovery from the pill scare that caused an increase in abortions in 1980. The number of reported abortions in China fell markedly from 14.4 million in 1983 to 8.9 million in 1984, rose again to 11.6 million in 1986 and then fell to 10.4 million in 1987. While there are some reporting uncertainties, the decline in 1984 could be a consequence of a massive increase in the number of sterilizations and IUD insertions in 1983[23] and of a relaxation of the population control effort in 1984.[24] Declines in abortion rates have also been recorded in three countries with less complete data—France, Italy and Japan; although it is possible that the reporting itself has deteriorated in these countries, it seems more likely that the increased acceptance of modern contraceptive methods has caused real declines. Data from surveys in South Korea illustrate the relationship between abortion rates and contraceptive use. Between 1973 and 1979, both the abortion rate and the contraceptive prevalence rate rose rapidly, reflecting the increased desire of couples to reduce their fertility. But from 1979 to 1985, contraceptive prevalence, especially sterilization, continued to increase, and the abortion rate fell back to its level of 1973.[25]

Since the widespread liberalization of abortion laws, illegal abortions have largely disappeared in most developed countries. However, physicians in Italy, Portugal, the Soviet Union and Spain still perform abortions that do not meet all the requirements of the law and, as such, are

Table 2. Number of abortions, abortion rate per 1,000 women aged 15–44, abortion ratio per 100 known pregnancies* and total abortion rate,† by completeness and reliability of data and country

Type of data and country	N‡	Rate	Ratio	Total rate
Statistics believed to be complete				
Australia (1988)	63,200	16.6	20.4	484
Belgium				
In Belgium§ (1985)	10,800	5.1	8.7	u
All** (1985)	15,900	7.5	12.2	u
Bulgaria (1987)	119,900	64.7	50.7	u
Canada				
In Canada (1987)	63,600	10.2	14.7	299
All†† (1985)	74,800	12.1	16.6	u
China (1987)	10,394,500	38.8	31.4	u
Cuba (1986)	155,300	58.0	45.3	u
Czechoslovakia (1987)	156,600	46.7	42.2	1,400
Denmark (1987)	20,800	18.3	27.0	548
England and Wales‡‡ (1987)	156,200	14.2	18.6	413
Finland (1987)	13,000	11.7	18.0	356
German Democratic Republic (1984)	96,200	26.6	29.7	u
Hungary (1987)	84,500	38.2	40.2	1,137
Iceland (1987)	700	12.0	14.0	336
Netherlands ‡‡ (1986)	18,300	5.3	9.0	155
New Zealand (1987)	8,800	11.4	13.6	323
Norway (1987)	15,400	16.8	22.2	493
Scotland §§ (1987)	10,100	9.0	13.2	255
Singapore (1987)	21,200	30.1	32.7	840
Sweden (1987)	34,700	19.8	24.9	600
Tunisia (1988)	23,300	13.6	9.8	u
United States (1988)	1,590,800	27.3	28.8	797*†
Vietnam (1980)	170,600	14.6	8.2	u
Yugoslavia (1984)	358,300	70.5	48.6	u
Statistics that are incomplete				
Bangladesh (menstrual regulation, FY 1989)	77,800	3.4	1.6	u
France*‡ (1987)	161,000	13.3	17.3	406*§
German Federal Republic				
In country (1987)	88,500	6.7	12.1	197
All** (1986)	92,200	7.0	12.8	u
Hong Kong (1987)	17,600	12.7	20.1	u
India (FY 1987)	588,400	3.0	2.2	u
Ireland†* (1987)	3,700	4.8	5.9	139
Israel (1987)	15,500	16.2	13.5	u
Italy (1987)	191,500	15.3	25.7	460
Japan (1987)	497,800	18.6	27.0	564
Poland (1987)	122.600	14.9	16.8	u
Romania†‡ (1983)	421,400	90.9	56.7	u
Soviet Union (1987)	6,818,000	111.9	54.9	u
Estimates based on surveys or other data				
Bangladesh (menstrual regulation, FY 1986)	241,400	12	5	u
Japan (1975)	2,250,000	84	55	u
South Korea (1984)	528,000	53	43	u
Soviet Union (1982)	11,000,000	181	68	u
Spain (1987)	63,900	8	u	u
Switzerland (1984)	13,500	9	15	u
Turkey (1987)	531,400	46	26	u

*Known pregnancies are defined as legal abortions plus live births. Births have not been lagged by six months because the necessary birth data are unavailable for most countries.

†The number of abortions that would be experienced by 1,000 women during their reproductive lifetimes, given present age-specific abortion rates.

‡Rounded to the nearest 100 abortions.

§Abortions performed in 17 hospitals and 20 nonhospital facilities, usually illegally.

**Including abortions obtained in the Netherlands and England.

††Including abortions obtained in Canadian clinics and in the United States. ‡‡Residents only.

§§Including abortions obtained in England. *†1985 data. *‡Provisional data. *§1986 data.

†*Based on Irish residents who obtained abortions in England.

†‡Combining counts of illegal abortions with treated complications and of legal abortions.

Notes: Sources of country data for this table available from author; u=unavailable.

not counted as legal abortions. Moreover, traditional practitioners may still be performing abortions in these countries and in Romania (before 1990) and Yugoslavia because of the persistence of restrictions, legal barriers and local customs.

In developing areas, abortions are commonly performed by both physicians and traditional practitioners whether or not the procedure is legal. In Asian countries such as Bangladesh and Indonesia, physicians provide menstrual regulations while traditional practitioners provide abortions by massage, insertion of objects into the uterus and other folk methods. In Latin America, abortion services are available from physicians in all major cities and in clinics in some areas. In several cities, including, for example, Bogotá and Rio de Janeiro, abortion clinics and physicians advertise in newspapers, without, however, using the word "abortion." Nevertheless, because of the cost of these services and their scarcity outside of major cities, many or most abortions in Latin America are probably self-induced or performed by nonmedical practitioners. Cuba, where abortion is available on request, is a notable exception.

In Africa and parts of the Middle East, the desire for large families is still prevalent, and abortion is thought to be less common than in Latin America, where fertility rates have fallen rapidly. Nevertheless, hospital studies indicate that complications of illegal abortions are a major public health problem. For example, Kenyatta National Hospital in Nairobi, Kenya, treats 50 to 60 women a day for abortion complications.[26] A community-based study in Addis Ababa, Ethiopia, found that 24 percent of all maternal deaths and 54 percent of those directly related to pregnancy were attributable to complications of clandestine abortions.[27]

According to the numbers in Table 2, approximately 22 million legal abortions were reported in 1987 (or the closest year for which data were available for the countries listed). The number of unreported legal abortions can be estimated at six million—most of these accounted for by India, Japan, South Korea and the Soviet Union*—but this estimate is uncertain and could range from four to nine million. The estimated number of legal abortions performed worldwide in 1987 was approximately 28 million, but may have ranged from 26 million to 31 million. These estimates of the numbers of legal abortions are lower than those made in 1986 (33 million, with a range of 30–40 million) because reported abortions in China declined by four million and newly published abortion statistics for the Soviet Union resulted in a decrease in the maximum estimate for that country.

Information on clandestine abortions is too uncertain to determine whether the worldwide total is increasing or decreasing, since few studies in developing countries have provided accurate measures even for small areas. Combining the estimates that other authors have generally used with guesses as to the probable rates of abortion results in rough estimates of clandestine abortions: approximately two million in the Soviet Union, four million each in India and Latin America, 500,000 in Bangladesh, 600,000 in the rest of South Asia, 1.5 million in the rest of Asia, 400,000 for Romania and 1.5 million for Africa. This totals 15 million clandestine abortions, but, again, the uncertainty of the estimates suggests that the number could be as low as 10 million or as high as 22 million. The estimated worldwide total of abortions is therefore between 36 and 53 million, yielding an annual rate of 32–46 abortions per 1,000 women of reproductive age.

Health Issues

The World Health Organization (WHO) has estimated that 99 percent of the 500,000 maternal deaths that occur worldwide annually take place in developing countries; of these, 115,000–204,000 result from complications of illegal abortions performed by unqualified practitioners.[28] A more conservative estimate may be derived from hospital studies that suggest that, on average, 20–25 percent of maternal mortality is attributable to abortion,[29] yielding totals of 100,000–125,000 deaths annually from illegal abortion. The WHO estimates that more than half of the deaths caused by induced abortion occur in South and Southeast Asia; the next largest proportion take place in Sub-Saharan Africa. The numbers are only approximations because of the difficulty in distinguishing between deaths from induced abortion and those from spontaneous abortion in countries where induced abortion is illegal, because of the problems of generalizing from studies done in particular hospitals and localities, and because of the relatively small number of studies that have been reported. A literature review found the highest reported mortality rate to be 2,400 deaths per 100,000 abortions in a rural area of Bangladesh.[30]

The provision of abortion under modern medical conditions has reduced abortion mortality to an extremely low level in developed countries that have legalized the procedure. The aggregate mortality rate of 13 countries for which accurate numbers of deaths and abortions are known is 0.6 deaths per 100,000 legal abortions. The procedure in these countries is now safer than pregnancy and childbirth. During 1981–1985 in the United States, the maternal mortality rate excluding deaths from abortion and ectopic pregnancy was 6.6 deaths per 100,000 live births, a rate that is 11 times that associated with legal abortion.[31]

The possible effects on maternal mortality of the legal restrictions on abortion can be seen in Romania, where most abortions were prohibited in 1966. Between 1965 and 1984, abortion mortality rose from 21 deaths to 128 deaths per 100,000 live births. Over the same period, maternal mortality from other causes fell from 65 deaths to 21 deaths per 100,000 live births.[32] In 1984 alone, the WHO reports that there were 449 abortion deaths in Romania.[33]

The stage of pregnancy at which an abortion is performed affects the risk of mortality and complications; regardless of legal status and medical care, the risk of mortality rises with increasing gestation.[34] In 1981–1985 data for the United States, for example, deaths per 100,000 legal abortions rise from 0.2 at eight or fewer weeks since the last menstrual period to 0.3 at 9–10 weeks, 0.6 at 11–12 weeks, 3.7 at 16–20 weeks and 12.7 at 21 weeks or more.[35]

Most legal abortions are performed relatively early in pregnancy. The proportion performed before nine weeks since the last menstrual period is 40–55 percent in a majority of the 16 countries with data, although the range is from 23 percent in New Zealand to 85 percent in Czechoslovakia. Among countries without legal restrictions on second-trimester abortions, the proportion done after 12 weeks' gestation ranges from four percent in Singapore to 15 percent in India. Few abortions are performed after 20 weeks, the most being 0.9 percent among residents of England and Wales, where women are required to receive authorization for abortion from two physicians. Later abortions are most common among women younger than 20 and among women with little education.

The safest abortion procedure is suction curettage (vacuum aspiration), which is used for the large majority of abortions in industrialized countries. The older method of dilatation and curettage, which requires more cervical dilatation and has more risk of cervical injury, is still commonly used in Hungary and, reportedly, the Soviet Union. In developing countries where abortion is legally restricted, most physicians are not trained in suction curettage and do not have the necessary equipment, so dilatation and curettage is most often used. Early in the second trimester, instrumental evacuation (dilatation and evacuation) has been shown to be safer than instillation procedures[36] and is increasingly being used in the developed countries for procedures up to and beyond 20 weeks. In the United States, 61 percent of abortions past 15 weeks are performed by dilatation and evacuation.

---

*In making estimates for the Soviet Union, the difference between the seven million abortions reported and the 11 million estimated to have occurred (see Table 2) was assumed to be due half to unreported legal procedures and half to illegal abortions.

Abortions performed by instrumental evacuation may be provided safely in both hospital and nonhospital facilities.[37] While practices vary widely among countries, the trend in developed countries is toward provision of services outside of hospitals, in clinics and physicians' offices. Similarly, among abortions performed in hospitals, an increasing proportion are outpatient procedures not requiring overnight hospitalization. Leading these trends is the United States, where in 1988 only 10 percent of abortions took place in hospitals and only 1.5 percent involved overnight stays. A majority of abortions are also provided outside of hospitals in the Netherlands (81 percent) West Germany (70 percent), Poland (54 percent, not including unreported abortions performed in physicians' offices) and Norway (51 percent).

Surgical contraceptive sterilization may be safely performed with an abortion. Among the 10 countries with available data, the one with the highest proportion of abortions with concurrent sterilization is India (29 percent in 1982–1983 according to officials statistics). Among the developed countries with data, the proportion ranges from seven percent in Canada to 1.4 percent in the United States, and it may be even lower in certain countries without data, such as some countries of central and eastern Europe, where sterilization is uncommon. The proportions tend to be low in developed countries such as the United States, in part because a high proportion of women having abortions are unmarried or of low parity and want to have children in the future.

Discussion

Much is known about the prevalence of induced abortion and its demographic and health effects in developed countries, where the procedure is generally provided legally in medical settings. In developing countries, however, information is scarce despite the number of people affected. Complications of nonmedical abortions are a major cause of maternal mortality, and their treatment absorbs a large share of the medical resources devoted to obstetrics and gynecology. Abortion rates reflect the extent of unplanned pregnancy and can, therefore, serve as an indicator of the unmet need for family planning services. While new research initiatives on the epidemiology and effects of abortion in developing areas have been undertaken by several international organizations, these efforts will only just begin to fill the information gap.

References

1. R. J. Cook and B. M. Dickens, "International Developments in Abortion Laws: 1977–88," *American Journal of Public Health*, **78**:1305, 1988.

2. Ibid., p. 1307.

3. R. S. Samil, "Commentary on Menstrual Regulation as a Health Service: Challenges in Indonesia," *International Journal of Gynecology & Obstetrics*, Supplement 3, p. 29, 1989.

4. H. P. David, "Romania Ends Compulsory Childbearing," *Population Today*, Mar. 1990, p. 4.

5. G. Lewthwaite, "Ceausescu Hit Hard at Abortion," *The Record*, Hackensack, N.J., Jan. 14, 1990, p. A-37; and M. Dobbs, "Dictator's Dream Took Harsh Toll," *The Washington Post*, Jan. 5, 1990, p. A1.

6. *Abortion Research Notes*, Vol. 17, Nos. 1–2, July 1988, p. 5.

7. Article II, Section 12 of the Philippines constitution.

8. Webster v. Reproductive Health Services, 57 U.S.L.W., No. 88-605, July 3, 1989.

9. R. Amin et al., "Menstrual Regulation Training and Service Programs in Bangladesh: Results from a National Survey," *Studies in Family Planning*, **20**:102, 1989.

10. "Incidencia del Aborto Provocado en España," Federación de Planificación Familiar de España, Madrid, 1989.

11. M. Muramatsu, "Estimation of Induced Abortions, Japan, 1975," *Bulletin of the Institute of Public Health*, **27**:93, 1978.

12. J.-K. Lim, S.-Y. Lee and H.-O. Bae, "Prevalence of Induced Abortion in Korea," *Journal of Population and Health Studies*, Vol. 9, No. 1, July 1989.

13. *1988 Turkish Population and Health Survey*, Hacettepe University Institute of Population Studies, Ankara, 1989.

14. E. F. Jones and J. D. Forrest, "Contraceptive Failure in the United States: Revised Estimates from the 1982 National Survey of Family Growth," *Family Planning Perspectives*, **21**:103, 1989.

15. M. S. Bednii, *Demograficheskie Faktori Zdorovia*, Finansi i Statistika, Moscow, 1984.

16. M. Dondénaz, *Avortement-Interruption de Grossesse: le Cas de la Suisse*, Réalités Sociales, Lausanne, 1987.

17. M. S. Bednii, 1984, op. cit. (see reference 15).

18. Academy of Sciences, State Committee of Labor, *Annual Demographic Report*, Moscow, 1988, p. 319.

19. S. L. Tosi et al., *L'Interruzione voluntaria di gravidanza in Italia, 1983*, Istituto Superiore di Sanità, Rome, 1985.

20. A. Charfeddine, "Evolution Récente du Programme National de Planning Familial," *Revue Tunisienne des Etudes de Population*, **1**:105, 1980.

21. A. R. Measham, M. Obaidullah and M. J. Rosenberg, "Complications from Induced Abortion in Bangladesh Related to Types of Practitioner and Methods, and Impact on Fertility," *Lancet*, **1**:199, 1981.

22. K. Holmgren, "Sweden, an Open Society," *Planned Parenthood in Europe*, Vol. 18, No. 1, 1989, p. 15.

23. Renmin Weishen Chubanshe, *Zhengguo weisheng nianjian 1985*, Beijing, 1985.

24. K. Hardee-Cleaveland and J. Bannister, "Fertility Policy and Implementation in China, 1986–88," *Population and Development Review*, **14**:245, 1988.

25. J.-K. Lim, S.-Y. Lee and H.-O. Bae, 1989, op. cit (see reference 12).

26. F. M. Coeytaux, "Induced Abortion in Sub-Saharan Africa: What We Do and Do Not Know," *Studies in Family Planning*, **19**:186, 1988.

27. B. E. Kwast, R. W. Rochat and W. Kidane-Mariam, "Maternal Mortality in Addis Ababa, Ethiopia," *Studies in Family Planning*, **17**:288, 1986.

28. E. Royston and S. Armstrong, eds., *Preventing Maternal Deaths*, World Health Organization (WHO), Geneva, 1989.

29. L. Liskin, "Complications of Abortion in Developing Countries," *Population Reports*, Series F, No. 7, 1980.

30. A. R. Kahn et al., "Induced Abortion in a Rural Area of Bangladesh," *Studies in Family Planning*, **17**:95, 1986.

31. Special calculations using data on maternal deaths from U.S. National Center for Health Statistics (NCHS), *Vital Statistics of the United States, Volume II, Part A*, 1981 and succeeding years; and NCHS, "Advance Report of Final Natality Statistics, 1985," *Monthly Vital Statistics Report*, Vol. 36, No. 4, Supplement, 1987.

32. E. Royston and S. Armstrong, eds., 1989, op. cit. (see reference 28).

33. WHO, *World Health Statistics Annual 1986*, Geneva, 1986, p. 478.

34. E. Royston and S. Armstrong, eds., 1989, op. cit. (see reference 28).

35. Special tabulations from data on deaths provided by The Centers for Disease Control; and S. K. Henshaw and J. Van Vort, eds., *Abortion Services in the United States, Each State and Metropolitan Area, 1984–1985*, The Alan Guttmacher Institute, New York, 1988, Detailed Table 4, updated to 1985.

36. M. E. Kafrissen et al., "Midtrimester Abortion: Intraamniotic Instillation of Hyperosmolar Urea and Prostaglandin F2a Versus Dilatation and Evacuation," *Journal of the American Medical Association*, **251**:916, 1984.

37. D. A. Grimes et al., "Abortion Facilities and the Risk of Death," *Family Planning Perspectives*, **13**:30, 1981.

Resumen

Durante los últimos cuatro años se ha mantenido la tendencia mundial a la liberalización de las leyes sobre el aborto, que han sido modificadas en 10 países. En otros cuatro, las leyes se han hecho, sin embargo, más restrictivas, pero de forma que ha de afectar a pocas mujeres. El 40 por ciento de la población mundial reside

(Continued on page 76)

Women, Work and Reproduction In Karachi

"The breakdown of kinship ties in urban areas . . . and consequent employment of women in the informal sector do not seem to enhance their relative autonomy in the household or to influence current fertility."

By Zeba A. Sathar and Shahnaz Kazi

Summary

A survey of 1,000 women in Karachi was undertaken to measure the effect of both education and employment on women's fertility and status (their relative autonomy within the family and perceived economic independence). Results show that women's status improves with 10 or more years of education and with employment in professional or other salaried positions outside the home; however, having less than 10 years of schooling and working in low-paying service sector jobs or in income-earning activities at home shows little effect. Employment in professional or higher paying jobs appeared to have more effect than education on lowering women's fertility in the five years prior to the survey.

Introduction

Pakistan continues to experience a substantial population growth rate of 3.1 percent per annum,[1] despite the efforts of its population program during the past 25 years. The lack of any notable change in fertility levels has been attributed to the lack of social change. Because of considerable economic progress, Pakistan now ranks as a middle-level economy; however, social indicators such as infant mortality rates, educational enrollment rates of children, literacy levels and proportion of women in the labor force fail to show similar improvements.[2] The status of women is very low in Pakistan, even within the context of South Asia; compared with men, women have limited access to education, health care and employment opportunities.

However, certain social changes may be underway in major urban areas of Pakistan that are not visible in national statistics.[3] Although official data, known to greatly underestimate women's employment, shows only a limited increase in women's labor force participation during the past two decades, evidence from more intensive studies points to an increase in employment of women in urban areas.[4] Furthermore, women's employment is growing at both ends of the occupational spectrum. For example, women from middle- and higher-income groups have been able to acquire a university education and have assumed professional jobs in fields such as teaching and medicine; these women make up a substantial proportion of professional workers, growing from 15 percent of that category to 18 percent between 1984 and 1989.[5] Other evidence from major urban areas also shows an influx of female workers in the informal sector; some are employed in the service sector as domestic servants, and others have undertaken low-paying jobs at home. Most of these women are illiterate and possess few skills. They belong to the lowest strata of society, and are pushed into employment out of dire economic necessity.

This duality of female employment, also noted in other countries in South Asia,[6] has important implications for women's status as well as for the employment-fertility relationship. Low levels of employment have been cited as a feature of the low status of women in Pakistan, but it is questionable whether employment outside the home necessarily raises women's status either at the societal level or within the household, in terms of having a voice in major decisions. In Pakistan, except for certain approved jobs such as teaching or medicine, employment outside the home may lead to a loss of social status. Status within the household is a function not just of employment but of type of employment.

Arguments about role incompatibility between motherhood and employment and the opportunity costs of giving up employment to bear children apply more aptly to developed societies. In Pakistan, child-care arrangements are so different from those in developed countries, and cultural constraints to women's employment so severe, that other factors are more likely to influence the effects of employment on fertility. Not surprisingly, recent cross-national studies have failed to identify any significant influence of female employment on fertility in most developing countries.[7] Previous national surveys conducted in Pakistan, which divided women by current employment status, have found little or no association between female employment and fertility.[8] However, these studies were constrained by the limited number of employed women, and by the fact that women were not further classified by various types of employment, which may have a qualitatively different impact on fertility. Past data sets lacked any details on household conditions (such as child-care arrangements), pattern of work (such as the stage at which women became employed) and decision-making within the household (such as whether the women were working because of family circumstances or out of individual choice). This article analyzes new data collected for Karachi, to determine whether the current trends in female employment in urban areas are likely to lead to any concomitant changes in status and fertility.

Methods

The present study generated data on both demographic and socioeconomic aspects of households as well as measures of women's status relative to their employment, autonomy in family decision-making, child-care arrangements, employment histories and other factors. The women in our sample were purposively selected to

---

Zeba A. Sathar is chief of research for demography, and Shahnaz Kazi is chief of research for economics, at the Pakistan Institute of Development Economics. The authors are grateful to the Frederich Ebert Foundation and the Rockefeller Foundation for their financial support of this research.

enable the study of interrelationships between employment, education, domestic responsibilities, autonomy and fertility. Consequently, working women were oversampled to compensate for the shortage of women employed in different types of occupations as encountered in national samples.

The survey of 1,000 ever-married women between ages 15 and 52 (only two women were older than 50) was conducted from March to May 1987 in Karachi. The sample comprises 680 women who were currently employed for pay and 320 who were not currently working. Because of oversampling techniques, the ratio of working women to nonworking women is more than 2:1 (in a random sample the ratio would be closer to 7:100). All major localities of Karachi were classified into high-, middle- and low-income groups and the sample of nonworking women was divided almost equally across these three strata. Working women were mainly sought out in their place of work: The survey team first identified major occupations in the formal and informal sectors where women were employed and interviewed the women accordingly.

Table 1 shows some of the socioeconomic and demographic characteristics of the women in the sample. Because of almost equal representation of working women in formal and informal sector jobs, the sample contains a much larger proportion of educated women than would have been the case in a probability sample. It also is likely to be biased in favor of high-income households for the same reason. However, efforts were aimed at selecting ample numbers of nonworking and working women from Karachi's squatter settlements where about 35 percent of the city's population lives.[9] The age distribution of women in the localities from which the Karachi Survey sample was drawn corresponds closely with that found for women living in major urban areas by the Pakistan Contraceptive Prevalence Survey, 1984–1985.[10]

Results

The findings from the survey are organized in three parts. The first section examines employment patterns among Karachi women, especially as they relate to household arrangements; the second describes three broad categories of employment and their association with women's relative autonomy in the household; and the third discusses fertility behavior in relation to the above measures.

One of the primary motivations for collecting data in Karachi was to learn more about female work patterns in urban areas. Because of the recognized problem of underenumeration of female work in Pakistan's official statistics,[11] an effort was made to select women in varied types of employment, particularly those working in the informal sector. In addition, female enumerators were asked to ascertain from the female respondents themselves (rather than from male household members) whether they were "doing any work for money or aiding any family member in work," to ensure representation of women who perform paid work in their homes and those in family-based employment.

The sample of working women can effectively be divided into two categories. One group includes women of relatively high socioeconomic status who are employed in the formal sector as professionals or teachers, clerical workers or factory workers. These women entered the labor market with an average of 10 years of education and considerable skill, in pursuit of careers for personal fulfillment or for enhancement of financial security. The other group, from more economically disadvantaged households, generally entered the labor market when they were older and work in low-income occupations in the informal sector (as domestic servants, casual laborers or vendors) and at home (in income-earning activities such as tailoring and embroidery). For the majority of these women, entry into the labor market is not a voluntary or planned decision, but a response to a sudden change in their economic situation, such as the unemployment of the husband, separation, divorce or widowhood.

Table 2 lists the average age, years of schooling and income of women who have ever worked in the formal and informal sectors, compared with those who have never worked. As would be expected, women who work in the formal sector, and their husbands, have educational and income levels considerably higher than those who work in the informal sector. Women employed in the formal sector also marry approximately four years later than those working in the informal sector. Women who have never worked have an educational level somewhere between the other two groups, and an average age at marriage only slightly higher than that of women who work in the informal sector. (Despite having no personal income, the household income reported by these women was, on average, twice that of women working in the formal sector; we believe it is likely that either they were ill-informed about household income or they exaggerated it.)

Table 1. Percentage distribution of ever-married women, by characteristic, Karachi Survey, 1987

Characteristic	%
Age	
<20	1.3
20–24	5.6
25–29	20.4
30–34	19.0
35–39	19.6
40–44	16.5
≥45	17.6
Education	
No schooling	52.0
<Secondary	22.4
≥Secondary	25.6
Monthly household income (in rupees*)	
<1,000	16.1
1,000–1,499	14.5
1,500–1,999	14.4
2,000–3,499	19.7
3,500–4,999	9.5
≥5,000	25.8
Marital status	
Currently married	87.1
Divorced/separated	3.7
Widowed	9.2
Total	100.0

*1,000 rupees = U.S. $45

Regarding patterns of employment, women who have ever worked in the formal sector are much more likely to have worked before marriage. In fact, the majority of these women begin working after the completion of their education and remain employed with few or no interruptions for marriage or births of children. Professionals and teachers, in particular,

Table 2. Average age, education and income of ever-married women and their husbands, by women's work history

Measure	Ever worked		Never worked
	Formal sector (N=374)	Informal sector (N=331)	(N=295)
Age			
Women	35.0	35.5	34.3
Husbands	40.0	42.5	41.3
Women at marriage	21.9	17.8	18.1
Education (in yrs.)			
Women	10.0	1.5	4.7
Husbands	13.2	3.6	8.5
Monthly income (in rupees)			
Respondents	1,921.5	526.0	na
Households	5,320.2	1,870.3	10,419.2

Note: na=not applicable.

Table 3. Percentage of ever-married women, by three measures of autonomy, according to education and employment

Education and employment	N	Family size decisions		Old-age support		Knowledge of contraceptive methods	
		Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Education (In yrs.)							
0	519	62	63	5	8	87	89
1–9	146	73	75	7	9	88	89
≥10	334	89	85	45	39	95	92
Beta value			0.22		0.36		0.06
F-value			19.52		31.89		1.08
Employment							
Ever worked in formal sector	374	86	80	39	30	96	95
Ever worked in informal sector	331	65	71	4	12	87	88
Never worked	294	63	63	7	9	86	86
Beta value			0.15		0.24		0.13
F-value			10.48		70 35		6.53
R^2			0.09		0.29		0.03

Note: The F statistic is only indicative of significance (when >1.96), because strictly speaking, the statistic applies only in the case of a random sample.

who have considerable upward mobility prospects, tend to avoid breaks in work experience that would hamper their careers and promotions. In contrast, the lower stratum of working women are very unlikely to have worked before marriage. Not surprisingly, they do not have any prior commitment to their work role and enter the labor force after marriage and after the birth of at least one child. Forty-one percent of informal sector workers started working after they had at least four children.

Recent attention in the international literature has been devoted to how women resolve the conflict between domestic responsibilities and employment. In this survey, fewer than 10 percent of currently employed women said that they would give up their jobs if there were an increase in domestic responsibility, and only 23 percent of women who were currently unemployed gave domestic or child-care responsibilities as reasons for not seeking employment. It seems that in Pakistan, women's employment need not interfere with domestic responsibilities. One reason is that child-care surrogates are readily available: Eighty-six percent of women employed in the formal sector and 15 percent of those employed in the informal sector said that relatives looked after their children at home. The most frequent caretakers were the respondents' mothers (29 percent), mothers-in-law (21 percent) and eldest daughters (15 percent). Mothers of the respondents looked after their grandchildren whether or not they were living in the same household. Most of the women in this sample lived in extended family households, where the burden of household work (and child care) may be lightened by other relatives. Seventy percent of women working in the informal sector lived in such households, compared with 53 percent of those in the formal sector. A notable difference between the two categories of working women is that only one percent of those working out of necessity employed servants or other unrelated persons to care for their children, while 14 percent of women working in the formal sector did so. Finally, there is little conflict between child care and employment among women working in the informal sector because the vast majority (84 percent) of these women were involved in income-generating activities that they could do at home.

We also sought to determine whether employment in the formal vs. informal sector is associated with any difference in women's relative status within the household (estimated by their relative autonomy to make important decisions) or in their attitudes regarding fertility and future economic independence. Considering that many of the efforts being made recently to improve women's conditions in Pakistan are through income-generation schemes, it is critical to establish whether employment per se is associated with changes in status (measured by decision-making within the household) or in attitudes closely linked with childbearing. Any relationship between employment and women's status may be mediated by education, since women seeking employment in the formal sector are more likely to have higher levels of education than those in the informal sector or those women currently not in paid employment. It is imperative, therefore, to disentangle the effects of education from those of employment; we will show the effects of education adjusted for those of employment, and vice versa.

The relative impact of employment and education on a woman's autonomy will be assessed in three spheres: decision-making about family size, expectations of support in old age and knowledge of contraceptive methods. In the first case, the binary variable was given a value of one if women thought they should make decisions about family size either on their own or jointly with their husbands, and a value of zero if they thought these decisions should be made by the husband alone or by elders of the household, or if it should be left up to God. The results presented in Table 3 suggest a statistically significant effect of both education and employment on the belief that women should make decisions about family size, either alone or with their husbands. Women with more than 10 years of schooling are much more likely than their less-educated peers to think that women ought to make decisions about family size, either alone or with their husbands. Though the effects of employment are less strong, women working in the formal sector are clearly more likely than those in the informal sector or those who never worked to think that women should participate in such decisions.

Similar results were found regarding women's expectations about who would provide for them in old age. Again, a binary variable was used, with a value of one when women expect to rely on rents, pensions or other income and zero if they expect to rely on children in old age or to leave it up to God. The proportion of women who thought that they could support themselves in old age through pensions, savings and rents was much higher among women with 10 or more years of schooling than among those with less education. However, the difference between those with no education or 1–9 years of schooling was marginal. There was an independent effect of employment on this measure of status as well: After education was controlled for, women engaged in formal employment were less likely than others to expect to rely on children and traditional sources of support in old age; informal sector employment did not have such an impact on women's perceptions of economic independence.

Table 4. Among ever-married women, mean number of children born in five years preceding survey and mean desired family size, by education and type of employment

Education and employment	N	Mean number of recent births*		N	Mean desired family size†	
		Unadjusted	Adjusted		Unadjusted	Adjusted
Education (in yrs.)						
0	493	0.86	0.85	400	5.33	5.14
1–9	133	0.90	0.83	118	5.36	5.31
≥10	285	0.78	0.83	300	3.40	3.68
Beta value			0.01			0.33
F-value			0.06			36.18
Employment						
Formal sector	308	0.61	0.63	295	3.63	4.18
Informal sector	299	0.97	0.97	257	5.42	4.95
Unemployed	304	0.93	0.93	266	4.97	4.82
Beta value			0.16			0.15
F-value			11.49			7.73

*Refers to births in five years preceding survey. Because birth dates were missing for some children, 911 women are included. Employment refers to status at time of survey.

†Includes 818 women who gave numerical responses. Desired family size measured by adding number of additional children women said they wanted to number of living children. Employment refers to ever worked and never worked.

Notes: R^2=0.120 for mean number of recent births and 0.203 for desired family size. The F statistic is only indicative of significance, because strictly speaking, it only applies to random samples.

In the third category presented in Table 3, the dependent variable is unrestricted knowledge of contraceptive methods: It differentiates those women who face no resistance from their husbands or families that might hinder their knowledge of methods or a supply source (assigned a value of one) from those who do face such obstacles (assigned a value of zero). The setting of our survey in Karachi probably accounts for the minor variations among women for this measure. Even so, it is interesting that differences across employment categories exceed those across education; in fact, the effect of education does not appear to be significant. Women in formal sector employment are slightly less likely to face hindrances to knowledge of birth control than women who never worked; although differences between women in informal sector employment and those who never worked are negligible. Employment in the formal sector, which is most often nonfamilial and involves leaving the home, appears to grant women greater mobility and enhanced knowledge about where to seek means of fertility control.

The results show that women's employment in the formal sector does have an impact on relative autonomy in family decision-making and on beliefs about economic independence. The ultimate question is whether paid employment changes women's orientation towards reproduction and fertility choices independent of the effects of education. We used number of children born in the last five years and desired family size as major dependent variables to assess reproductive behavior; age was controlled for as a measure of differing exposure times to childbearing.

Interestingly, the effects of employment on fertility are stronger than the effects of education and they appear to be statistically significant. Table 4 shows that after age and education are controlled for, women who have ever worked in the formal sector have about two-thirds the level of recent fertility (mean number of births in the last five years) of women who ever worked in the informal sector and those who never worked. In contrast, women with 10 or more years of schooling have about the same level of recent fertility as uneducated women. The differential in desired family size, however, is much greater across education groups. Women with 10 or more years of schooling want fewer children than uneducated women do (3.7 vs. 5.1). Smaller differences are seen with regard to employment: Women working in the formal sector say they would like 4.2 children while women in the informal sector desire 4.8 children.

Conclusions

These results, based on the study of a purposive sample of women in Karachi, ought to be viewed as tentative speculations of how women's work in urban areas is likely to influence their relative autonomy and fertility. The recent expansion of urban female employment, which is concentrated in professional occupations in the formal sector as well as in low-paying jobs in the informal sector, has mixed implications for women's status and fertility. Employment opportunities will not necessarily enable women to gain status within their households nor to change their reproductive behavior. Specifically, the breakdown of kinship ties in urban areas (which in the past supported female relatives in situations of divorce, destitution or widowhood) and consequent employment of women in the informal sector do not seem to enhance their relative autonomy in the household or to influence current fertility. In contrast, women who are employed in the formal sector (and are more likely to have a commitment to their careers, more prospects of upward mobility and higher salaries) desire fewer children, have lower current fertility and perceive themselves as more independent.

The majority of women in Pakistan are not currently employed, either because they do not possess the training to get socially acceptable jobs in the formal sector or because they are not compelled by financial hardship to seek jobs in the informal sector. Both the desired and current fertility of these nonworking women are similar to those among women working in the informal sector. Thus, it appears that the prospects for change in women's status and fertility lie not in the expansion of income-generation schemes or in employment per se but in increased opportunities for women in jobs that are valued by society.

References

1. World Bank, "Rapid Population Growth in Pakistan: Concerns and Consequences," Washington, D.C., 1989.

2. Z. A. Sathar, "Possible Reasons for Retardation in Fertility Change in South Asia," paper presented at the Sixth Annual General Meeting of Pakistan Society of Development Economists, Islamabad, Jan. 1990.

3. Z. A. Sathar et al., "Women's Status and Fertility Change in Pakistan," *Population and Development Review*, Vol. 14, No. 3, 1988.

4. Z. A. Sathar and S. Kazi, "Productive and Reproductive Choices of Metropolitan Women: Report of a Survey in Karachi," Pakistan Institute of Development Economics, Islamabad, 1988; and F. Shaheed and K. Mumtaz, "Invisible Workers: Piece Labour Amongst Women in Lahore," Women's Division, Islamabad, 1981.

5. S. Kazi, "Some Measures of the Status of Women in the Course of Development in South Asia," paper presented at the Seminar on Status of Women and their Role in Development, Marga Institute, Colombo, 1989.

6. M. Bhapat and N. Crook, "Duality of Female Em-

(Continued on page 80)

DIGEST

Growing Proportion of Thai Women Now Begin Contraceptive Use to Delay First Marital Birth

A dramatic shift in the initiation of contraceptive use has taken place in Thailand over the past two decades. Most Thai women now begin to practice contraception soon after a first birth, and a growing proportion initiate use soon after marriage to postpone a first pregnancy. Thus, Thailand has reached an advanced stage of fertility transition, and Thai women may be on the way toward achieving full control over marital fertility. These are the main conclusions of an analysis of contraceptive initiation patterns based on data from the 1987 Thailand Demographic and Health Survey (TDHS).[1]

Using questions unique to the TDHS in addition to items from the core questionnaire, the researchers examined patterns of first contraceptive use among the 6,775 married women aged 15–49 in the sample. The additional questions asked when contraception was first practiced, which method was first used and, for the 2,347 women who gave birth within four years of the interview, how soon after the return of menses contraceptive use was either initiated or resumed. Combining these responses with the answers to standard questions on current family size and desired number of children, the researchers were able to infer the stage of family building and thus to speculate on whether an episode of contraceptive use was initiated primarily for the purposes of spacing or for limiting births.

The investigators found that, compared with more recently married women, those married for 20 years or more were more likely both to have never used a contraceptive method and to have initiated use only after exceeding their preferred number of children. For example, 31 percent of women in the older marriage cohort, compared with five percent of those married 10–14 years, started contraceptive use after having had more children then they preferred. Thus, older Thai women, if they used contraceptives at all, initiated use presumably to limit childbearing, while younger women were more likely to begin using a method to space births.

When the analysis is restricted to women with at least two children, the same trend toward earlier initiation of use emerges. Younger marriage cohorts were far more likely to have started contraceptive use earlier—before their first pregnancy or between the births of their first and second child—than were the older marriage cohorts. For example, 20 percent of women married 5–9 years initiated contraceptive use prior to the birth of their first child, compared with just two percent of women married 20–24 years. Furthermore, 37 percent of the more recently married women with two children began use after the birth of their first child, while the proportion among comparable women married for 20–24 years was eight percent.

Even though the majority of women in each marriage cohort had ever used a method, initiating use to postpone a first pregnancy is widespread only among the most recently married women; the proportion of these women steadily decreases with years since marriage. For instance, 42 percent of women married 0–4 years began contraceptive use before their first pregnancy, compared with 26 percent of those married 5–9 years, 13 percent of those married 10–14 years and five percent of those married 15–19 years. Furthermore, among women who used a method prior to a first pregnancy, the interval between marriage and the onset of use was fairly short—81 percent began use within the first two months of marriage.

Pronounced differentials in early first use exist according to rural-urban residence, region and level of educational attainment. Among women in all marriage cohorts, the proportion who began contraceptive use prior to a first pregnancy was higher in urban areas than in rural areas (29 percent vs. 15 percent); highest in the northern region (62 percent) and lowest in the southern region (24 percent); and higher among women with at least a secondary education than among those who completed 0–3 years of schooling (56 percent vs. 31 percent).

Eighty-eight percent of the TDHS sample are Thai-speaking Buddhists. However, there is substantial variation in first contraceptive use both within that majority population and between it and minority groups. Within the Thai-speaking majority, 81 percent of those speaking the northern-Thai dialect who have been married less than five years used a method to delay a first marital birth, compared with 30 percent of comparable women speaking the southern-Thai dialect. Overall, Moslems were much less likely than Buddhists to have started contraceptive use before a first pregnancy (although first use among Moslems also varied by linguistic groups), and Cambodian speakers and members of the hill tribes were the least likely to have used contraceptives to delay a first marital birth.

Among women who initiate use before a first pregnancy, the pill is by far the most commonly used method (73 percent). The pill is also the most popular first method among women who have not yet reached their preferred number of children (56 percent) and among those who have already had all the children they say they want (44 percent). Only in this last category do other methods, namely male and female sterilization, approach the popularity of the pill (30 percent combined).

The researchers applied life-table methodology to analyze trends in contraceptive initiation after childbirth. The findings indicate that Thai women initiate contraceptive use soon after delivery: Among women who gave birth in the four years preceding the survey, one-half began using a method within four months of giving birth. The proportion increases to 72 percent by the end of the first year following delivery and reaches 85 percent by the end of the second year.

In Thailand, female sterilization is most often performed immediately after childbirth, rather than between births. Thus, the 18 percent who chose sterilization necessarily initiated their method use by the first month following a delivery. For other methods, however, use increased with each month elapsed since childbirth and reached 41 percent of women at six months postpartum, 53 percent at one year and 66 percent at two years. Among ethnic groups, the pattern of contraceptive initiation after childbirth closely follows the pattern of use to delay a first marital pregnancy. The Thai-speaking Buddhist majority are the likeliest to initiate use soon after childbirth—nearly two-thirds of these women have done so at six months postpartum, compared with less than one-half of hill tribe women and only one-third of Moslems and Cambodian speakers.

The timing of method use after the return of menses offers a more direct measure of exposure to the risk of pregnancy. Excluding sterilization, nearly one-half of Thai women have already adopted a method one month following the return of menses. When sterilization is included, that proportion rises to almost two-thirds. There is little difference in this measure by urban-rural residence and educational level, especially if the analysis is restricted to the majority population. For example, among Thai-speaking Buddhists, 67 percent of urban women and 68 percent of rural women had initiated use one month after the return of menses. Similarly, the proportion of majority women who initiated use one month after their menses returned was identical among those who had had secondary schooling and those with just 3–6 years of schooling (67–68 percent).

The investigators point to these findings as evidence that "Thailand's reproductive revolution has taken firm hold throughout the core of Thai society." They hypothesize that as societies move toward complete control of marital fertility, a shift occurs so that contraceptive use is initiated first primarily to limit births, then to space births as well, and, finally, use is initiated shortly after marriage to postpone a first pregnancy. Based on their analysis of the TDHS data, the authors conclude that "Thailand is rapidly approaching a stage of full fertility control" as most couples now initiate contraceptive use soon after childbirth and the proportion of women who begin use before a first pregnancy has risen sharply and steadily over the past two decades.—*L. Remez*

Reference

1. J. Knodel and N. Chayovan, "Contraception Initiation Patterns in Thailand," *Health and Population Studies Based on the 1987 Thailand Demographic and Health Survey*, Demographic and Health Surveys Further Analysis Series, Number 1, Institute of Population Studies, Chulalongkorn University, Bangkok, Dec. 1989.

In Sri Lanka, a Majority Of Couples Have Talked About Family Planning

Most Sri Lankan couples have talked about contraceptive use and family size, according to a recent national study, but some groups—older couples, Muslim couples, those with less education and those who live on tea estates—are significantly less likely to have had such discussions.[1] In general, there is agreement between husbands and wives as to whether they have had such discussions, but husbands are somewhat more likely to say that they have been practicing contraception than are their wives.

In 1985, the Sri Lankan Department of Census and Statistics conducted the Sri Lankan Contraceptive Survey (SLCS), a national follow-up to a similar survey performed in 1982. (However, because of political disturbances, only 17 of the nation's 24 districts could be resurveyed.) The 1985 sample consisted of 2,310 currently married women between the ages of 15 and 49 who had participated in the 1982 survey and had remained married over the three intervening years. In addition, the husbands of one in four respondents (577 in all) were interviewed separately.

Among all respondents, 76 percent of the women and 74 percent of the men said they had discussed family planning with their spouse, although less than 10 percent of each said they had done so before their first child was born. "For most couples, therefore," the investigators observe, "family planning communication and the use of contraception appeared to be for the purpose of spacing or limiting births rather than [for delaying] the first pregnancy after marriage." For both the husbands and wives, the proportion who said they had discussed contraception with their spouse was highest among the younger and better educated respondents. In addition, communication was greatest among those who said they wanted no more children. Both urban and rural residents were more likely to report having discussed family planning with their spouse than were those who lived on tea estates. Those with 2–4 children were the most likely to have discussed family planning, while those with no children or with six or more were the least likely to have done so.

All respondents who knew of specific contraceptive methods were asked how and where they had first heard of them. Women were far more likely then men to have heard of male methods from their spouse; for example, about two-thirds of the women said they had heard of withdrawal from their husband, whereas fewer than one-third of the men said they had heard of withdrawal from their wife. On the other hand, husbands were far more likely than wives to say they had heard of such methods as the pill, the IUD, injectables, female sterilization and rhythm from their spouse.

Slightly more than half of the women said they had discussed with their spouse the number of children they wanted to have, and about two-thirds of the husbands said they had done so. The younger and better educated respondents were most likely to report having talked about family size with their spouse.

The investigators then conducted logistic regression analyses of the likelihood that a woman had discussed either contraceptive use or family size with her husband. The analysis revealed that when such factors as age, age at marriage, number of living children, desire for more children, education, area of residence and religion are controlled for simultaneously, the couple's number of living children and area of residence and the woman's education and religion were significantly related to the likelihood that a woman had discussed family planning with her husband. For example, women with 10 or more years of education were almost 2.6 times as likely as those with no schooling to have done so, and urban and rural women were 3.8 and 2.7 times as likely to have done so, respectively, as women who lived on tea estates. Women with 2–3 children were 1.9 times as likely to have discussed family planning with their husband as were those with 0–1 children, and Christian women were 3.1 times as likely as Muslim women to have done so.

Characteristics that had a significant impact on the likelihood that a woman had talked with her husband about the number of children she wanted were current age, number of living children, educa-

DIGEST

tion and area of residence. Education's impact was the most substantial: Compared with women with no schooling, those with 10 or more years of education were 3.5 times as likely to have spoken with their husband about their family-size desires, those with 6–9 years of schooling were 2.4 times as likely and those with 1–5 years of education were 1.5 times as likely. Women 30–39 were about one-third less likely and those 40–49 were nearly two-thirds less likely than 18–29-year-olds to have had such a discussion, and those with four or more children were about half as likely as other women to have done so. Finally, urban and rural women were 3.5 and 2.5 times as likely, respectively, as those who lived on tea estates to have discussed family size with their husband.

A direct comparison of the responses of the 577 husband-wife pairs who were interviewed revealed that about 80 percent of husbands and wives were consistent in their responses to the question about discussion of family planning; however, 11 percent of the time, the husband claimed that he and his wife had discussed family planning but the wife said they had not, while in eight percent of couples, the wife reported that they had and the husband that they had not. With regard to family-size discussions, only two-thirds of the couples replied consistently; in 24 percent of the couples, the husband claimed to have discussed the topic with his wife when the wife said he had not, while in 11 percent the wife claimed to have had such a discussion and the husband said they had not.

Furthermore, only about half of husbands and wives reported the same desired family size; 28 percent of the wives reported wanting more children than their husbands wanted, while 22 percent of the husbands reported wanting more children than their wives did. However, the overall mean desired family size was about the same among husbands and wives (about 3.4 children, on average). When asked how many children their spouse wanted, a majority of the men and women correctly reported their spouse's answer, but wives tended to slightly overestimate their husband's desire for more children while husbands underestimated their wife's desire for more children.

Overall, 69 percent of the women surveyed in the main sample reported that they were practicing contraception. However, a comparison of the responses of the 577 husbands and wives showed that 81 percent of the husbands reported they were currently practicing contraception, compared with only 71 percent of the wives. The men and women were in virtual agreement about their reliance on female sterilization (33 percent each), male sterilization (10 percent and nine percent, respectively), the pill (four percent vs. three percent), the IUD (three percent vs. four percent) and injectables (one percent each), but more husbands than wives reported using periodic abstinence (22 percent vs. 14 percent), withdrawal (15 percent vs. 11 percent) and the condom (seven percent vs. four percent). The investigators hypothesize that some female respondents may have forgotten or may have been too embarrassed to report using a male method, that some women may not have known their husband was practicing rhythm or that husbands may have represented past use of a method as current use.

Finally, the researchers found that among couples using the condom, rhythm or withdrawal (reversible methods that require the involvement of the husband), couples in which the husband and wife replied inconsistently about their fertility desires were more likely than those with consistent responses to have experienced an accidental pregnancy. The difference was not statistically significant, though, possibly because of small sample size.

The investigators conclude that Sri Lankan spouses generally communicate well about family planning, but that some groups—particularly older couples, Muslims, those with little or no education and those living on tea estates—are significantly less likely to talk about family planning. Improving the status of women, increasing the exposure of husbands to information about family planning and enlisting religious leaders' support for family planning are all steps that the investigators suggest could increase spousal communication and improve the practice of family planning.—*M. Klitsch*

Reference

1. T. T. Kane and S. Sivasubramaniam, "Family Planning Communication Between Spouses in Sri Lanka," *Asian and Pacific Population Forum*, 3:1, 1989.

Although Primary Liver Cancer Remains Rare, Pill Use Appears to Increase Risk in Women Under 50

Oral contraceptives may increase the risk of primary liver cancer for young women who otherwise would be expected to be at low risk for the disease, according to a recent study.[1] If the pill does have such an effect, it is probably an initiating one rather than a promoting one because the vast majority of the study subjects with liver cancer had stopped using the pill at least eight years before they were interviewed. Nevertheless, despite the large number of women under age 50 in the United States who have used oral contraceptives at some time and would therefore be expected to be at increased risk of liver cancer, the disease remains very rare in that age-group.

Women with liver cancer were identified as part of a case-control study conducted at 17 hospitals in five U.S. cities* from 1977 through 1985. In that study, nurses trained as interviewers collected medical and reproductive data, including information on timing and duration of oral contraceptive use, from patients with recently diagnosed cancers and from other patients on the medical, surgical and orthopedic wards of the same hospitals. Five percent of all the patients who were approached refused to participate.

Fifteen of the women who were interviewed had been diagnosed with primary liver cancer within the preceding year and had no other primary cancer or history of the disease. Three of them were excluded from the present analysis because they were age 60 or over and thus would have had little or no opportunity to use oral contraceptives. Of the 12 remaining women (all 19–54 years old), nine had hepatocellular cancer, two had cholangiocarcinoma and one had a liver cancer of undetermined type. None had a history of hepatitis, but one woman with hepatocellular cancer was found during surgery to have cirrhosis of the liver.

Controls were selected from among 3,665 interviewed patients who did not have cancer and whose conditions were judged to be unrelated to pill use. Five controls were matched to each cancer patient by hospital location, date of interview and five-year age-group. Because heavy alcohol consumption increases the risk of liver disease, the researchers also compared the drinking habits of cases and controls in the year prior to hospitalization, but found no appreciable difference between the two groups.

---

*Baltimore, Boston, New York, Philadelphia and San Francisco.

Eight of nine women with hepatocellular carcinoma had taken oral contraceptives (89 percent), compared with 16 of 45 controls (36 percent). Seven of the nine cases (78 percent) had taken the pill for at least two years, and three had done so for at least five years (33 percent); among the 45 controls, the corresponding proportions were 20 percent and 11 percent, respectively. To calculate the relative risk of hepatocellular cancer, the investigators used conditional logistic regression analyses that controlled for the matching factors—age, year of interview and geographic location of the hospital. The relative risk of hepatocellular cancer, both among women who had used oral contraceptives for 2–4 years and among those who had taken the pill for five or more years, was 20 times the risk among those who had done so for under two years. Among the women who had taken oral contraceptives in the past or were taking them at the time of the study, the median duration of use was 35 months for the cases and 36 months for the controls. Seventy-one percent of users among the cases and 69 percent of those among the controls had stopped taking the pill eight or more years before they were interviewed.

According to the investigators, "the present findings suggest that oral contraceptive use increases the risk of hepatocellular carcinoma." However, these data must be interpreted with caution because of the small number of cases involved. Most of the oral contraceptive users with hepatocellular carcinoma had stopped using the pill years before their diagnosis, which indicates that if the pill does have a carcinogenic effect, it is likely to be an initiating one rather than a promoting one. There was no evidence that pill formulation or duration of use has an effect; furthermore, no inferences could be drawn about the relationship of pill use to type of liver cancer, because only two cases of cholangiocarcinoma were found.

The investigators observe that liver cancer is extremely rare among U.S. women younger than 50, even though many of them have used oral contraceptives at some time; therefore, if there is a causal connection between pill use and liver cancer, "the actual number of cases of liver cancer . . . attributable to oral contraceptives is small." They add that the disease is much more prevalent in other parts of the world, especially where infection with hepatitis B, a major cause of hepatic carcinoma, is common. They conclude, therefore, that these findings "do not have public health importance in the United States and other Western nations."—*F. Althaus*

Reference

1. J. R. Palmer et al., "Oral Contraceptive Use and Liver Cancer," *American Journal of Epidemiology*, **130**:878, 1989.

In Ghana, Most Women Know a Modern Method But Very Few Use One

In Ghana, continuing high levels of fertility reflect early and almost universal marriage and low contraceptive prevalence. On average, a woman will marry at 18.5 years and will have six children before she is 45. Although 23 percent of married women want no more children and 45 percent want to wait at least two years before having another child, only 13 percent are using any method of contraception and just five percent are using a modern method. Polygyny is common, but appears to be declining among younger women. These are some of the highlights of the Ghana Demographic and Health Survey (GDHS), conducted in 1988 among a sample of 4,488 women aged 15–49 and a subsample of 943 co-resident husbands.[1]

The Republic of Ghana, which gained its independence from Great Britain in 1957, is located on the west coast of Africa. The country's last census, in 1984, counted 12.3 million Ghanaians, an increase of 44 percent over the 1970 census total. About two-thirds of the population live in rural areas. The Akans are the largest of Ghana's numerous ethnic and linguistic groups (44 percent); over half the country's people are Christian.

Overall, about 60 percent of Ghanaian women of reproductive age have had some education, with 16 percent attaining some primary schooling, 37 percent attending middle school and eight percent going beyond middle school. Among urban women, 73 percent have had some education, compared with 54 percent among rural women. Levels of education appear to be rising: At the time of the survey, only 19 percent of women aged 15–19 had no education, compared with 74 percent of those aged 45–49.

In general, the husbands in the sample were older and better educated than their wives. Only 17 percent of the husbands were younger than 30, compared with 48 percent of the married women. The husbands were less likely than their wives to be uneducated (38 percent vs. 47 percent) and were more likely to have gone beyond middle school (16 percent vs. six percent).

Nuptiality and Fertility

The median age at first union among Ghanaian women aged 20–49 is 18.3 years. There is some indication that younger women are marrying later: The median for 20–24-year-olds was nearly a year older than that among 45–49-year-olds (18.7 vs. 17.8). The effect of education is particularly striking: The median for women with no education was 17.8 years, compared with 22.3 years for those with higher education.

Almost all Ghanaian women enter some type of union during their reproductive years: In 1988, less than one-half of one percent of women 40–44 years old had never been married.* Overall, 65 percent of women aged 15–49 were legally married, six percent were living in an informal union, three percent had previously been in a consensual union, seven percent were widowed or divorced and 20 percent had never been married.

One-third (33 percent) of the married women interviewed were in a polygynous union. However, the practice of polygyny appears to be declining: Only 16 percent of married women 15–19 years old were in such unions, compared with 43 percent of those 35–39 years old. Rural women were more likely than urban women to be in polygynous unions (34 percent vs. 28 percent); likewise, those with no education were more likely to be in such unions than those with 11 or more years of schooling (40 percent vs. 19 percent). The proportion of women in polygynous unions also varied by area, ranging from 25 percent to 48 percent among the 10 regions of Ghana.

At the time of the survey, 26 percent of the husbands had more than one wife. The proportion of the husbands in a polygynous union rose from 10 percent of those younger than 30 to 39 percent of those aged 50 or older. Moreover, polygyny was three times as prevalent among husbands who were uneducated as among those with higher education; as was the case among the women in the survey, husbands in rural areas were more likely to be in polygynous unions than those in urban areas.

---

*In the Ghana DHS, both formal and informal unions are considered marriages.

DIGEST

In 1988, the median age at first birth among women aged 20–49 was 19.6. Urban women were about a year older than rural women when they had their first child (20.3 vs. 19.3). The median age at first birth increased with level of education, from 19.2 among women with no education to 19.9 among those with a middle school education and 23.7 among those with higher education.

The total fertility rate (TFR) for 1985–1988 among women aged 15–44 was 6.1 lifetime births per woman. Urban women had a TFR of 5.1, compared with 6.6 among rural women. Women with no education had a TFR of 6.7, almost double the TFR among women with higher education (3.6). Only 1.6 percent of women aged 40–49 were childless. Comparison with data from the 1979 Ghana Fertility Survey (GFS) suggests that fertility declined only slightly, if at all, in the last decade: The TFR among women aged 15–44 for the five years before the GFS was 6.3 lifetime births per woman, compared with a TFR of 6.1 for the five years preceding the GDHS. The data indicate that any fertility decline that occurred did so during the mid-to-late 1970s, but did not continue into the 1980s.

At the time of the survey, 56 percent of the women who had given birth within the preceding 36 months were breastfeeding their infants. On average, Ghanaian women breastfeed for 20 months and experience postpartum amenorrhea for 14 months. Although the average duration of postpartum sexual abstinence is 14 months, nearly 25 percent of women are still abstaining 20–21 months after giving birth; as a result, the mean period of insusceptibility to pregnancy is 18 months. Rural women breastfeed and observe sexual abstinence for several months longer than urban women; as a result, they are protected from the risk of pregnancy for more than three months longer (18.9 months vs. 15.8 months). Women with higher education breastfeed their infants for a shorter period of time than uneducated women (16 months vs. 23 months), resume sexual intercourse sooner after childbirth (nine months vs. 17 months), experience a shorter period of amenorrhea (nine months vs. 16 months) and are susceptible to the risk of pregnancy much sooner (12 months vs. 21 months).

Contraceptive Knowledge and Use

In 1988, 79 percent of married women knew of a method of birth control (an increase from 69 percent in the 1979 GFS) and 77 percent knew of a modern method. Urban women were much more likely than rural women to know about a modern method (88 percent vs. 71 percent) and to know of a source for that method (82 percent vs. 64 percent). Women with higher education were much more likely than uneducated women to know about a modern method (98 percent vs. 60 percent) and to know where to obtain it (96 percent vs. 52 percent). The pill was the most widely known modern method (64 percent), followed by female sterilization (57 percent), condoms (50 percent), injectables (47 percent), the IUD (40 percent) and vaginal methods (38 percent); only 11 percent of the women knew about male sterilization. The best-known traditional methods were periodic abstinence (41 percent) and withdrawal (33 percent).

Among currently married women, 37 percent had ever used a contraceptive method; 23 percent had used a modern method. Ever-use of any method was lowest among 15–19-year-olds, peaked among 25–44-year-olds and declined among older women, suggesting efforts to space births. The data also indicate a trend toward using birth control to postpone the beginning of childbearing: Only two percent of ever-married women aged 40–44 had used a method before their first pregnancy, compared with 17 percent of those aged 20–24.

At the time of the survey, 13 percent of currently married women were using any method and five percent were using a modern method. Overall, periodic abstinence was the most widely used method (six percent), followed by the pill (1.8 percent), vaginal methods (1.3 percent) and female sterilization (one percent). Condoms, the IUD, withdrawal, injection and other methods were each used by fewer than one percent. Urban women were twice as likely as rural women to use any method (20 percent vs. 10 percent) and to use a modern method (eight percent vs. four percent). Women with higher education were more likely than those with no education to use any method (29 percent vs. nine percent) and to use a modern method (10 percent vs. three percent).

Among the husbands, 79 percent knew of at least one method of contraception; 41 percent had ever used a method and 20 percent were current users. When only modern methods were considered, 76 percent knew of a method, 26 percent had ever used one and nine percent were current users. The most widely known method was the pill (63 percent), followed by condoms (60 percent), female sterilization (58 percent), periodic abstinence (45 percent) and withdrawal (41 percent). The most widely used method was periodic abstinence (nine percent), followed by the pill (four percent), withdrawal (three percent), condoms (two percent), vaginal methods (two percent) and female sterilization (one percent). Modern method use was three times as high among husbands younger than 30 as among those 50 or older (12 percent vs. four percent); likewise, urban husbands were almost twice as likely to use a modern method as rural husbands (14 percent vs. eight percent) and husbands with higher education were more likely to be current users than those with no education (20 percent vs. one percent).

Planned Parenthood clinics, pharmacies and chemical sellers were the major sources of pills, condoms, injectables and vaginal methods, while government hospitals were the most frequently named source for female sterilization and IUDs.

Of all births in the 12 months before the survey, 30 percent were mistimed (wanted, but at a later time) and four percent were unwanted. At the time of the survey, 20 percent of the currently married women wanted a child soon, 45 percent wanted to wait at least two years before their next birth, four percent wanted another child but were not sure when, five percent were not sure if they wanted another child and 23 percent did not want more children; four percent were infecund. Nevertheless, only 20 percent of the nonpregnant women who were not using contraceptives said they intended to use a method in the next 12 months. Most of these women planned to rely on the pill (24 percent), injectables (24 percent), periodic abstinence (10 percent) or female sterilization (seven percent). Of the husbands who were not using a method at the time of the survey, 17 percent intended to use a method in the next 12 months, 14 percent intended to use one later and four percent intended to use one, but were not sure when.

Of the married women and the husbands who knew about a contraceptive method, 74 percent and 77 percent, respectively, approved of family planning. However, fewer than half of the husbands and the wives who knew of a method had discussed family planning with their spouse in the preceding year. Moreover, of the women whose husbands approved of family planning, 18 percent thought their husband disapproved and 23 percent did not know their husband's opinion.

In 1988, the mean ideal number of children among currently married women was 5.5; among all Ghanaian women, it was 5.3. Overall, women in rural areas wanted more children than those in urban areas (5.6 vs. 4.7), and those with no education wanted more children than those with higher education (6.4 vs. 4.0). The ideal family size decreased from 6.5 among women aged 45–49 to 4.7 among those aged 15–19. In general, the husbands wanted more children than their wives: On average, they considered 7.6 children ideal and about 12 percent said it was "up to God." Husbands aged 50 or older wanted four more children, on average, than those under 30. Husbands with no education wanted twice as many children as those with higher education (10.4 vs. 5.2). Only 19 percent wanted no more children.

Maternal and Infant Health

Overall, the mothers of 82 percent of the infants born in the five years preceding the survey had received prenatal care from a doctor or a trained nurse or midwife; during the same period, 70 percent of the births were to mothers who had been vaccinated against tetanus. Forty percent of the births were attended by a doctor or a trained nurse or midwife. There was little difference by age, but women living in urban areas were much more likely than those in rural areas to have been assisted by trained health personnel (70 percent vs. 29 percent). Moreover, women with higher education were much more likely to have been attended by trained health personnel than those with no education (79 percent vs. 26 percent).

Infant and child mortality in Ghana remain high, despite decreases since the mid-1970s: In 1983–1987, 77 of every 1,000 infants died before reaching age one and 155 of every 1,000 children born died before their fifth birthday. The length of the preceding birth interval and mother's education had a strong effect on mortality rates: Mortality among infants born within two years of the mother's previous birth was more than double that among those born after an interval of four or more years (115 vs. 52 deaths per 1,000 births); under-five mortality followed a similar pattern. Likewise, under-five mortality was 75 percent higher among children of uneducated women than among children of women with higher education (175 vs. 100 deaths per 1,000).

In all, 33 percent of the children under age five had health cards; of this group, 97 percent had at least one immunization recorded. In addition, approximately 40 percent of the children without health cards were reported by their mother to have had at least one immunization. Approximately one-third of Ghanaian children aged 3–36 months were chronically malnourished; an additional eight percent were acutely malnourished.—*F. Althaus*

Reference

1. Ghana Statistical Service and Institute for Resource Development/Macro Systems, Inc., *Ghana Demographic and Health Survey, 1988,* Accra, Ghana, and Columbia, Md., Sept. 1989.

Vaginal Ring Is Effective For at Least One Year, Worldwide Trials Show

Clinical trials of the Silastic 382 vaginal ring indicate that it is an effective contraceptive method for at least one year of use.[1] The ring, which releases 20 mcg of levonorgestrel every 24 hours, was tested in 19 centers in 13 countries; 1,005 women participated in the tests. The pregnancy rate with the device in place was 3.7 per 100 women at the end of one year. The one-year discontinuation rate, including loss to follow-up, was 50 percent.

The vaginal ring used in the clinical trials was developed by the World Health Organization as a low-dose progestogen-only device. The ring, which contains a core of 5 mg of levonorgestrel, must be replaced every 90 days. In these trials, conducted from 1980 to 1986, the ring was tested in centers in Africa, Asia, Europe and Latin America.* Women selected for the study were aged 19–34, were menstruating and having intercourse regularly, had proven fertility (either a child or an abortion during their current marriage), had not used injectable or implant contraceptives in the previous three months or oral contraceptives in the previous month, and were able to fill out a menstrual diary card. The women were instructed not to have intercourse without the ring in place and not to remove the ring unless it was likely to be expelled during defecation, in which case it could be removed beforehand and reinserted immediately afterwards. Any expulsion or removal, as well as incidents of bleeding or spotting, were to be recorded in the diary.

A total of 26 pregnancies occurred with the ring in place, for a one-year cumulative pregnancy rate of 3.7 per 100 women. (One pregnancy, after 249 days of ring use, was ectopic; this rate is within the range of copper IUDs and progestogen-only contraceptive.) Pregnancy rates were consistent across regions, except for Africa, where life-table pregnancy rates were twice as high as in other regions (8.2 per 100 women, compared with a range of 2.9–3.8 in Asia, Europe and Latin America). Women had an increased risk of pregnancy with increased body weight, so that those who weighed 40 kg, for example, had an estimated rate of 1.7 compared with 9.8 among those weighing 80 kg.

Six additional pregnancies were attributed to intercourse without the ring in place; in five instances, the ring was removed by the subject, and in one, intercourse took place when the ring had been expelled without the subject's knowledge. Most of the 32 pregnancies ended in induced abortion, but four resulted in live births of normal babies; at the time these infants were conceived, the rings had been in place 5–8 weeks.

At the end of one year, 50 percent of the women originally enrolled in the study were no longer participants. Of these, 19 percent were lost to follow-up, and six percent had become pregnant. The remaining women discontinued use because of menstrual problems (27 percent), other medical reasons, such as vaginal irritation (21 percent), nonmedical reasons, such as desire to become pregnant (15 percent) and expulsion of the ring (11 percent). Discontinuation rates varied widely across regions; China had the lowest rate (32 percent) and Africa the highest (69 percent).

Although 57 women discontinued use because the ring was expelled, expulsion did not necessarily lead to discontinuation, since 243 women experienced a total of 504 expulsions. The majority of expulsions occurred during defecation (57 percent), while others coincided with menstruation (17 percent), urination (12 percent), strenuous activity (five percent) and intercourse (two percent). The odds of expulsion rose with age and parity, so that women who had had three children were almost twice as likely as those who had had only one to expel the device. Most women who expelled the device did so in the first six months: Twenty-three percent of women had done so within that time, compared with 29 percent at one year. The rate of second expulsions was 45 percent within six months of the first expulsion. Women in Asia had almost twice the first expulsion rate of women in the other regions.

---

*Women were enrolled in the study from one center each in Brazil, Colombia, Cuba, Pakistan, the Soviet Union, Sweden, Switzerland, Thailand, Tunisia and Zambia, from two centers in England, from three in India and from four in China.

A total of 121 women said they removed the ring at least once, most often because of pain or bleeding (26 subjects) and vaginal irritation or discharge (26 subjects). Other reasons given for removal included wanting to clean the ring, wanting to prevent expulsion during defecation, or simply being curious; less than one percent removed the ring because of discomfort during intercourse. There were low rates of removal in Asia and Africa and high rates in Europe. Removal rates in Latin America varied from center to center.

Menstrual disturbances such as prolonged, heavy or intermenstrual bleeding were the primary bleeding-related reasons women discontinued use. From menstrual diaries provided by 702 participants, the investigators determined that around half of the women in the study experienced changes in their bleeding patterns in each 90-day reference period. Irregular bleeding, experienced by approximately 25 percent of the ring users, was the most common complaint. Another 10 percent had prolonged menstrual cycles and 10 percent had shortened cycles.

The investigators speculate that some of the women who said they were discontinuing ring use to become pregnant might have been dissatisfied users; the menstrual diaries of all but four indicated menstrual disturbances such as prolonged bleeding or spotting episodes. In general, there was no strong correlation between reasons given for discontinuation and what was recorded in the menstrual diaries for the 90-day period prior to discontinuation. However, a trend analysis revealed that women with bleeding patterns differing most from the norm tended to discontinue method use first, and that the most recent bleeding pattern a woman experienced was the strongest factor in her decision whether or not to continue ring use.

The women who discontinued use of the ring because of other medical problems had experienced vaginal irritation, discharge or infection. Two women had what the investigators considered to be adverse reactions that could be related to the progestogen in the ring: One woman became hypertensive after six months of ring use, but her blood pressure returned to normal after discontinuation, and another discontinued after 56 days because of general itching and breast tenderness.

There were 77 discontinuations for nonmedical reasons, with desire to become pregnant the most common, followed by removal of the ring at the partner's request. Other reasons included a wish to change methods, adverse publicity, dissatisfaction and unspecified personal reasons.

The investigators conclude that the contraceptive efficacy and medical safety of the WHO vaginal ring are comparable to other low-dose, progestogen-only contraceptives for at least one year of use.
—*R. Turner*

Reference

1. Task Force on Long-Acting Systemic Agents for Fertility Regulation: Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, "Microdose Intravaginal Levonorgestrel Contraception: A Multicentre Clinical Trial, I. Contraceptive Efficacy and Side Effects," *Contraception*, 41:105, 1990; ——, "Microdose Intravaginal Levonorgestrel Contraception: A Multicentre Clinical Trial, II. Expulsions and Removals," *Contraception*, 41:125, 1990; ——, "Microdose Intravaginal Levonorgestrel Contraception: A Multicentre Clinical Trial, III. The Relationship Between Pregnancy and Body Weight," *Contraception*, 41:143, 1990; ——, "Microdose Intravaginal Levonorgestrel Contraception: A Multicentre Clinical Trial, IV. Bleeding Patterns," *Contraception*, 41:151, 1990.

Induced Abortion: A World Review, 1990

(Continued from page 65)

hoy en países donde para hacerse un aborto no hace falta justificación determinada, mientras que el 25 por ciento vive donde sólo se permite si corre peligro la vida de la mujer.

Las tasas de aborto legal oscilan entre un máximo de al menos 112 por cada 1.000 mujeres de edad reproductiva en la Unión Soviética y un mínimo de cinco por cada 1.000 en los Países Bajos. Durante los últimos años, las tasas de aborto han venido aumentando en Checoslovaquia, Corea del Sur, Inglaterra y Gales, Nueva Zelandia y Suecia y disminuyendo en China, Francia, Islandia, Italia, el Japón y los Países Bajos.

En los países desarrollados para los cuales existen datos, la mortalidad a consecuencia de abortos legales alcanza un promedio de 0,6 por cada 100.000 intervenciones. Los servicios se prestan cada vez más fuera de los hospitales, y en el caso de las intervenciones realizadas en hospitales, va haciéndose cada vez menos común la internacíon hasta el día siguiente. El curetaje por succión, la dilatacíon y la evacuación—los métodos más seguros—se utilizan cada vez más en países desarrollados pero en algunos de ellos y en ciertas regiones en desarrollo, especialmente donde el aborto está legalmente restringido, no se practican estas técnicas.

Résumé

La tendance mondiale à la libéralisation de la législation sur l'avortement s'est poursuivie au cours de ces quatre dernières années, comme en témoignent les changements enregistrés dans 10 pays. On notera certes un durcissement de la loi dans quatre pays, mais de manière susceptible de n'affecter que peu de femmes seulement. Quarante pour cent de la population du monde vit aujourd'hui dans des pays où l'avortement n'exige aucune justification particulière, et vingt-cinq pour cent dans des pays où la procédure n'est autorisée que dans les cas où la vie de la mère se trouve menacée.

Les taux d'avortement légaux varient entre un maximum d'au moins 112 avortements par 1.000 femmes en âge de procréer en Union Soviétique et un minimum de cinq pour 1.000 aux Pays-Bas. Ces dernières années ont vu les taux d'avortement augmenter en Angleterre et au Pays de Galles, en Corée (Sud), en Nouvelle Zélande, en Suède et en Tchécoslovaquie, tandis qu'ils se réduisaient en Chine, en France, en Islande, en Italie, au Japon et aux Pays-Bas.

Le taux de mortalité par suite d'avortement légal s'élève en moyenne à 0,6 décès par 100.000 procédures dans les pays développés documentés. Les services d'avortement sont de plus en plus organisés hors des hôpitaux, et dans les cas toujours pratiqués en hôpital, les séjours d'une nuit sont de moins en moins fréquents. Curetage par aspiration et dilatation et évacuation, les méthodes d'avortement les plus sûres, sont de plus en plus utilisées dans les pays développés bien que non disponibles dans certaines régions tant développées qu'en voie de développement, surtout lorsque l'avortement est soumis à une législation restrictive.

Books in Review

A Handbook for Family Planning Providers

Contraceptive Technology: International Edition
by Robert A. Hatcher, Deborah Kowal, Felicia Jane Guest, James Trussell, Felicia Hance Stewart, Gary K. Stewart, Sylvia Cerel Bowen and Willard Cates, Jr., Printed Matter, Inc., Atlanta, 1989, $16.00, 460 pp.

Reviewed by Aníbal Faúndes

The title of this book is misleading; it suggests that the authors will restrict themselves to the general description, the mechanism of action and the clinical features of contraceptive methods. Instead, the reader finds a comprehensive reference book on reproductive health, with the widest interpretation of the responsibilities involved in providing family planning services.

The authors begin by providing the reader with a perspective on a number of family planning aims for the beginning of the next century. Among these are improvement in the status of women; better control, prevention and treatment of sexually transmitted diseases, including AIDS; new and more efficient contraceptive and "interceptive" methods; significant reductions in child and maternal mortality; increases in breastfeeding, changes in the way the media portray sex (away from sex linked to violence and toward a positive view of sexuality); greater collaboration of rich nations in helping poorer ones provide appropriate reproductive health services; and, finally, a demographic equilibrium of the world population.

This opening chapter is a good introduction to what the reader will find in the body of the book. Each subsequent chapter presents a compassionate view of people's reproductive health needs, with suggestions on how family planning workers can best prepare themselves to provide better services. The chapter "Health Benefits of Family Planning" is based on an excellent publication from the Center for Population and Family Health, Columbia University; it has been updated where appropriate. The benefits to children and to mothers are illustrated with actual data showing the health improvement that can be achieved by preventing pregnancy in some specific groups of women. It also shows the convenience of linking family planning to maternal and child health services: Women at high reproductive risk are more easily identified, and future pregnancies may be prevented. The chapter also briefly describes how family planning benefits the couple, the family, the economic system and society. Next, there is a brief and interesting look at traditional practices influencing fertility, followed by the best summary on population and family planning that I have ever read.

The authors explain why they have included a chapter on population in a book on contraceptive technology:

> As firm believers in voluntary family planning . . . we do not view contraception, sterilization and abortion for individual couples primarily as a means to reduce population growth. We are interested in helping individuals achieve their reproductive life goals, whatever they may be. Nevertheless, individual reproductive choices do have aggregate consequences, since they determine the fertility of a population. It is only natural that those involved in family planning and reproductive health would be interested in understanding how the uses of contraception and its effectiveness, the prevalence of abortion and the duration of lactation affect the aggregate level of fertility in a population [p. 21].

One consideration missing from this statement is that in less-developed countries, certain socioeconomic factors inhibit the capacity of each individual to achieve his or her reproductive goals. For example, in Brazil, women working as maids cannot have a baby even if they want one, because pregnancy would cause them to lose their jobs and the money to feed themselves and any children they already have.

The chapter has two major attributes. First, the authors explain with great clarity some complicated demographic concepts. The text reads easily, without the mathematical or demographic jargon that makes this kind of article so arid and difficult for the average family planning worker. Second, it provides a well-balanced view of the relationship between family planning and population, and of the everyday effects of population dynamics on the lives of people, while keeping away from the "population explosion" propaganda. For example, the discussion of the effect of the one-child policy in the People's Republic of China on the age structure of the population and on other aspects of society is enlightening, as is the discussion of the ingenious alternative proposal to achieve the same desired demographic result by promoting two-child families, completed later in life.

The chapter "Policies and Laws Related to Reproductive Health" is an excellent reference for all those interested in family planning. However, interpretation of the current legal situation in some countries may differ from that of the authors. For example, most Brazilian lawyers would classify Brazil among "countries that have not clarified the legality of voluntary sterilization," and not among "countries in which voluntary sterilization for family planning purposes alone is illegal."

In addition, I am concerned about this chapter's reference to the IUD as a "postcoital procedure" that covers "the span

---

Aníbal Faúndes is a full professor of obstetrics at the University of Campinas, Sao Paulo, and a representative of the Population Council in Brazil.

from fertilization to implantation" [p. 71]. The chapter on IUDs partially clarifies this issue, but nevertheless suggests that the "lysis of the blastocyst and/or prevention of implantation" is a mechanism of action [p. 311]. In fact, recent data support the argument that copper IUDs act before fertilization, and that the postfertilization, or implantation-preventing, mechanism is an exception. As is clearly described in the book, both the IUD and the pill can be used postcoitally, but this does not mean that the normal mechanism of action of either method is prevention of implantation. Rather, the immediate endometrial reaction to an IUD insertion, or to the administration of a slightly higher dose of the pill for two days, will prevent implantation of a fertilized ovum in many cases.

In the next two chapters, the authors succeed in providing all the most important practical information on AIDS and other sexually transmitted diseases, updated to late 1988. The chapter on infertility has a very complete review of all the factors affecting reproductive performance, which underscores the role of family planning workers and health professionals in the prevention of infertility. The importance of the choice of contraceptive method in reducing the risk of infertility is clearly explained. However, under surgery, I would have added a caution regarding the newly popularized procedure for removal of ovarian "cysts" and "polycystic ovaries" through partial or total extirpation of basically normal ovarian tissue. It is unfortunate that such a complete book failed to include a discussion of this damaging practice, which is common in developing countries.

The review of the menstrual cycle, its disturbances and the influence of contraceptive methods on it contains some very practical considerations. Among these are suggestions about how to advise patients to reduce their risk of toxic shock syndrome. This is obviously of interest to users of vaginal methods or of methods that may cause increased bleeding.

Although the chapter on pregnancy testing explains what to do in the absence of pregnancy tests (which is the reality in most of the Third World), it is somewhat too technical to be useful in developing countries. On the other hand, the section on counseling a woman who suspects that she is pregnant is among the best examples of the authors' understanding of the patient's need for emotional support, as well as contraceptive technology. The discussion of lactation and contraception during breastfeeding is another example of completeness, clarity and up-to-date information useful to family planning workers.

The part of the book directly related to contraceptive technology opens with a very practical chapter called "Choosing a Contraceptive." Table 12.1, which lists safety concerns, side effects and noncontraceptive benefits of the major methods of contraception, should be used as a reference by every provider of these methods. In addition, the section on factors that influence efficacy should be kept continually in mind by family planning workers.

The following 11 chapters deal with every available contraceptive method, including the new implantable contraceptive, NORPLANT®; biodegradable implants and pellets; injectable microspheres and vaginal rings; and older methods, such as coitus interruptus. All of these chapters constitute a valuable current reference for family planning clinics around the world, and each is practical and complete, without excessive length. For each method there is a clear description of its different varieties, the extent of its use around the world, its advantages and disadvantages, and short- and long-term side effects and complications, as well as clear instructions on how to counsel and care for patients before, during and after the use of the method. In these chapters and throughout the book, the authors emphasize the importance of education and counseling for family planning clients.

I was less pleased with the chapter on abortion, partly because there was no mention of either menstrual regulation or postabortion contraception. Furthermore, although I find most of the information in the book very reliable, I do not agree that the number of abortions in Brazil could be as high as 3 million per year, or that there are 1.2 abortions for every birth. A discussion of current trends in family planning and reproductive health is found in the next chapter. Unfortunately, some of these trends, such as the move toward "high tech/high touch" or "personal provider-user interactions," may be more of a wish than a fact in many developing countries. However, the authors expect a more individualized, caring approach to family planning to become more common throughout the world.

The last five chapters come under the heading "Providing Family Planning Services," and include such topics as approaching the patient, health education, delivery of services and integration with other family health services. These chapters are brief, since all of the issues are dealt with in earlier chapters, but I found the section on principles and practices of adult learning (part of the health education chapter) to be of great practical interest.

The final chapter, "Management Questions Related to the Technology of Fertility Control," constitutes a very useful tool for family planning service providers at the clinic, city or country level. Table 30.2 is an excellent reference for both managers and clinicians, summarizing administrative decisions with respect to many health and management issues, their impact on clients and the recommended practice.

The reader of *Contraceptive Technology* will recognize that it is a volume with a clear line of continuity and unity, but also that almost any of its chapters is complete in itself. The authors have provided a great service by not requiring that the reader of any chapter know the content of the previous one. Thus, the book constitutes an ideal reference for clinics providing family planning and reproductive health services anywhere in the world. It has three main virtues: it is clear, complete and up-to-date (to the end of 1988).

Occasionally, however, the book loses its immediate usefulness for developing countries. Something that will draw the attention of every Third World reader is the emphasis on the use of condoms. I am sure that most of them will ask, as I did, "Okay, but where are the condoms?" The authors' message is well intended, but under current conditions it may cause more frustration than good, since many countries cannot afford to purchase the number of good-quality condoms required, and funding agencies do not have the capacity or the political will to provide condoms to all the countries that need such assistance.

There are a few other instances when the book loses its international perspective, but in general, the availability of *Contraceptive Technology* at reproductive health clinics around the world could make a very favorable impact on training, and could help to accelerate the positive trends that it discusses. However, according to my calculations, there are almost 325 million Spanish-speaking people and about 180 million each of Portuguese- and French-speaking people in the developing world who will not be able to use this English version. The potential benefits of the information contained in this book justify by far the expense of its translation and editing in other languages. The cost-benefit ratio of this would undoubtedly be higher than that of almost any other investment made for the same purposes.

Books in Review

Complex Analyses, Personal Decisions

Choosing a Contraceptive: Method Choice in Asia and the United States
ed. by Rodolfo A. Bulatao, James A. Palmore and Sandra E. Ward, Westview Press, Boulder, Colo., 1990, $38.50, 313 pp.

Reviewed by Barbara Entwisle

Why do couples choose particular contraceptive methods? This question prompted a seminar on the determinants of contraceptive choice, at the East-West Population Institute in August 1985. Consistent with the Institute's regional orientation, seminar papers focused on Asia and, to a lesser extent, on the United States. *Choosing a Contraceptive* contains revised versions of these papers.

As James A. Palmore and Rodolfo A. Bulatao point out in the introductory chapter, Asia provides a highly varied context for investigating method choice. Prevalence ranges from less than 10 percent in Pakistan and Nepal to 70 percent and higher in Hong Kong, Korea, Taiwan and Singapore. Method mix differs across regions as well: Female sterilization, male sterilization, the pill, the IUD and condoms are each the most popular method in at least one Asian country. Even within countries, it is rare to find the majority favoring a single method (China, India and Japan are the exceptions), and it is not unusual to find three or four methods each accounting for 15 percent or more of use. Method mix in Asia has also changed rapidly over time; the predominant trend has been a shift to more effective methods.

The editors divide the book into three sections. The first part provides psychological, social, spatial and economic perspectives on method choice, and gives an overview of selected models for analyzing decision-making, including some not yet applied to research on contraceptive choice and others still under development for this purpose. The second part presents a series of case studies from Bangladesh, India, Korea, Peninsular Malaysia, Sri Lanka and Thailand, and the third examines method choice in the United States. The introductory and concluding chapters review findings and offer organizing frameworks, helping to integrate the diverse material. In addition, the editors combine bibliographic references into a single listing and provide a unified index (all too rare in edited books).

The foreword and introductory chapter state that the volume is intended for policymakers and program managers as well as scholars. Whether the book can satisfy both audiences is open to question, though, since the study of method choice necessarily involves the use of complicated statistical techniques unfamiliar to readers who are not technical specialists. Despite laudable attempts to make results accessible to a general audience—by including sections on predicted probabilities, for example—it seems unlikely that the nonscholarly audience will read more than the introductory and concluding chapters.

Many contributors speak directly to the interests of policymakers and program managers, applying sophisticated but appropriate statistical techniques to questions of definite relevance to them. Several studies examine the effects of specific program strategies; two deserve special praise. In a study of the effects of outreach workers on contraceptive decision-making in rural Bangladesh, James F. Phillips and colleagues found that contact with female outreach workers increases the likelihood that women will use contraceptives more than contact with male workers does; this increase mainly involves methods dispensed in client homes, although the likelihood of sterilization increased as well. Another chapter discusses the sensitivity of users in the Philippines, Jamaica and Thailand to prices of particular contraceptive methods. The investigators in this study, J. Brad Schwartz and coauthors, found that price has a small but negative effect on choice of method (except for condoms). However, the study does not determine the effect of charging for contraceptives previously provided for free—information that is crucial to drawing any conclusions about subsidization.

Three other studies address aspects of the service environment explicitly: a study on the interaction between clinic availability, respondent education and reproductive desires in Peninsular Malaysia; a comparison of travel time to the source of a particular method and to sources of alternative methods in the Philippines and Egypt; and a pilot study of physicians' perceptions of the pill and three variants of the rhythm method in Mauritius, Peru, the Philippines and Sri Lanka. In addition, awareness of government services is included as one of the covariates of method choice in an analysis of Korean contraceptive practices.

Lessons for policymakers and program administrators can, of course, be drawn from studies that do not include a specific policy variable. A good example is the chapter by Ronald R. Rindfuss and associates that examines life cycle, background and current characteristics as predictors of contraceptive choice among white, non-Hispanic women in the United States using National Survey of Family Growth data from 1976 and 1982. One of these authors' most compelling findings was that the change in method-mix between 1976 and 1982, when pill and IUD use dropped dramatically, was not due to compositional changes in the population of contraceptive users but rather may have been the result of adverse publicity concerning medical risks of those methods, a possibility with

---

Barbara Entwisle is an associate professor and a fellow of the Carolina Population Center at the University of North Carolina at Chapel Hill.

clear policy relevance. Unfortunately, the authors' decision to group methods, distinguishing effective noncoital methods (pill and IUD) from less effective and coitus-related ones, tends to diminish the usefulness of their results for this purpose.

For the most part, contributors to the volume focus on method choice within countries. An exception is the concluding chapter, which tries to account for variation between as well as within countries. To explain why condoms are more popular in Japan (78 percent of all use in 1984) than in any other country, Bulatao points to the reliance of Japanese women on their husbands for contraceptive information (especially early in marriage), the women's purported indifference to sex, the limitations the medical establishment places on obtaining other methods and the availability of abortion as a back-up. These are interesting hypotheses, worth following up. Most contributors consider choices between two or more contraceptive methods, but two chapters do focus on particular methods—one on traditional methods in Sri Lanka and another on sterilization in the United States. The U.S. analysis is problematic in many respects, however, particularly in the questionable application of a computer program for maximum likelihood estimation procedures to a 14-equation system in which many of the dependent variables are dichotomous.

Taken together, the chapters represent an impressive body of work on contraceptive method choice. Certain unresolved issues become evident, some of which are acknowledged: the differences between the sterilization decision and other contraceptive decisions, the problems of selectivity caused by excluding sterilized women from analysis, reasons for omitting fertility intentions from model specifications, the importance of expanding the set of choices to include no contraceptive use and assumptions about decision-making that underlie the analysis of choice.

The book also offers some hints about future research directions. For example, the observation that women make choices about sources as well as methods, and that one may be contingent on the other, is a potentially fruitful subject for study. One contributor hypothesizes that effects of travel time on method choice in Egypt may be explained by the fact that women living close to a source may opt for methods requiring resupply more often, whereas women living farther away from sources choose methods that do not require frequent visits. Expansion of the decision-making model to include both method and source choices seems a worthwhile next step. Mixed multinomial logit models, which consider characteristics of a choice as well as of the individual making that choice, also hold promise, since variation in efficacy, cost, reversibility and potential for side effects undoubtedly affects decisions about particular methods. This approach is illustrated in the analysis of prices and method choice in Jamaica, the Philippines and Thailand. Finally, as appropriate data become available, the study of contraceptive method choice may become part of a broader study of contraceptive use dynamics.

Women, Work and Reproduction . . .

(Continued from page 69)

ployment: Evidence for a Study in Pune," *Economic and Political Weekly*, July 30, 1988.

7. United Nations (UN), "Women's Employment and Fertility: A Comparative Analysis of World Fertility Results," *Population Studies*, No. 96, New York, 1985; and G. Rodriguez and J. Cleland, "Socio-Economic Determinants of Marital Fertility in Twenty Countries," *World Fertility Survey Conference 1980*, Voorburg, Netherlands, 1986.

8. S. Syed, "Female Status and Fertility in Pakistan," *Pakistan Development Review*, Vol. 16, No. 4, 1978; and J. Casterline, "Fertility Differentials in Pakistan," in I. Alam and B. Dineson, eds., *Fertility in Pakistan: A Review of Findings from the Pakistan Fertility Survey*, International Statistical Institute, Voorburg, Netherlands, 1984.

9. UN, "Population Growth and Policies in Mega-Cities: Karachi," New York, 1988.

10. Population Welfare Division, Ministry of Planning and Development, *Pakistan Contraceptive Prevalence Survey*, Islamabad, 1986.

11. UN Statistical Office, "Report on the National Training Workshop on Women and Development in Islamabad," New York, Nov. 1986.

Resumen

Se llevó a cabo una encuesta entre 1.000 mujeres en Karachi para medir los efectos tanto de la educación como del empleo sobre la fecundidad y la posición de la mujer (su autonomía relative dentro de la familia y la manera como se percibe su independencia económica). Los resultados demuestran que mejora la posición de la mujer después de 10 años o más de instrucción o cuando es empleada en un puesto de nivel profesional u otro puesto asalariado fuera del hogar; sin embargo, si tiene menos de 10 años de instrucción o si trabaja en empleos de baja remuneración o en actividades remuneradas dentro del hogar, el efecto es mínimo. Ser empleada en puestos de nivel profesional u otros con remuneración más alta parecía tener mayor efecto que la educación en disminuir la fecundidad de la mujer en los cinco años anteriores a la encuesta.

Résumé

Une étude fut menée sur 1.000 femmes à Karachi pour mesurer l'effet de la scolarité et de l'emploi sur la fécondité et le statut de la femme (son autonomie relative au sein de la famille et son indépendance économique perçue). Les résultats indiquent une amélioration du statut de la femme qui a bénéficié de 10 années au moins de scolarité et qui occupe des fonctions professionnelles ou un poste salarié en dehors du foyer; scolarité de moins de 10 années et emploi dans le secteur des services à bas salaires ou des activités rémunérées à domicile ne produisent toutefois qu'un effet restreint. L'emploi à niveau professionnel ou salarial élevé s'est révélé produire un effet plus grand que la scolarité sur la diminution de la fécondité de la femme pendant les cinq années d'observation antérieure à l'étude.

International Family Planning Perspectives
Published quarterly by The Alan Guttmacher Institute

Editorial Office: 111 Fifth Avenue,
New York, N.Y. 10003, United States of America

Editorial Advisory Committee

Barbara M. Boland, Trinidad and Tobago

John C. Caldwell, National Centre for Epidemiology and Population Health, The Australian National University, Canberra

John Cleland, Centre for Population Studies, London School of Hygiene and Tropical Medicine, England

Mercedes B. Concepcion, The Population Institute, University of the Philippines, Manila

Ronald Freedman, The Population Studies Center of the University of Michigan, Ann Arbor

Noreen Goldman, Office of Population Research, Princeton University, Princeton, New Jersey

Roushdi A. Henin, Department of Sociology, University of Zimbabwe, Harare

Maria Helena Henriques-Mueller, Istanbul, Turkey

Shireen J. Jejeebhoy, Bombay, India

Gavin W. Jones, The Research School of Social Sciences, The Australian National University, Canberra

Lin Lean Lim, International Labor Office, United Nations, Bangkok, Thailand

Wolfgang Lutz, International Institute for Applied Systems Analysis, Lazenburg, Austria

Allan G. Rosenfield, School of Public Health, Columbia University, New York

Nafis Sadik, United Nations Population Fund, New York

Mpembele Daniel Sala-Diakanda, Institut de Formation et de Recherche Démographiques, Yaoundé, Cameroon

Zeba Sathar, Pakistan Institute of Development Economics, Islamabad

Claudio Stern, El Colegio de México, The Population Council, Mexico City

Léon Tabah, Comité International de Coopération dans les Recherches Nationales, Paris, France

Martin Vessey, Department of Public Health and Primary Care, University of Oxford, England

Subscriptions are $22 a year for individuals and $32 a year for institutions.

This publication is partly supported by the U.S. Agency for International Development (AID) through a cooperative agreement (no. DPE-0955-A-00-3005-11) with the Planned Parenthood Federation of America/Family Planning International Assistance. The contents of this publication do not necessarily reflect the views or policies of the AID.

Credits

Cover design: Sheldon Cotler + Associates